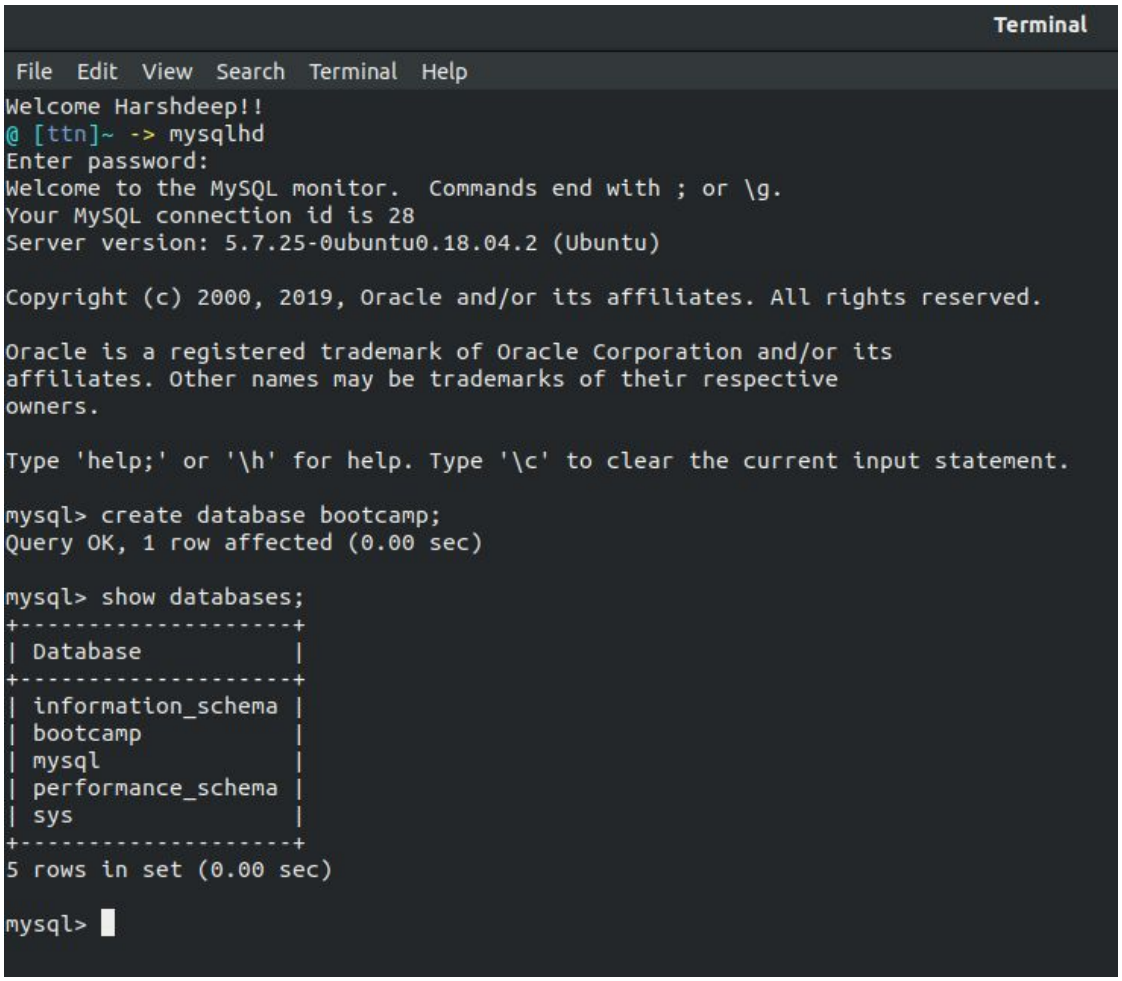
Exercise - Introduction to Database

Problem Statement: There can be multiple customers, who can place multiple orders on the site. Now a sales person can handle these orders will distribute into multiple sales persons (One order will be assign to one salesperson only). So a sales person can have multiple orders of multiple customers.

Create Database

Here we are creating a Database named *bootcamp* using command *create database <database name>;*.
And command *show databases;* lists all the databases present in the system.

Screenshot(s)

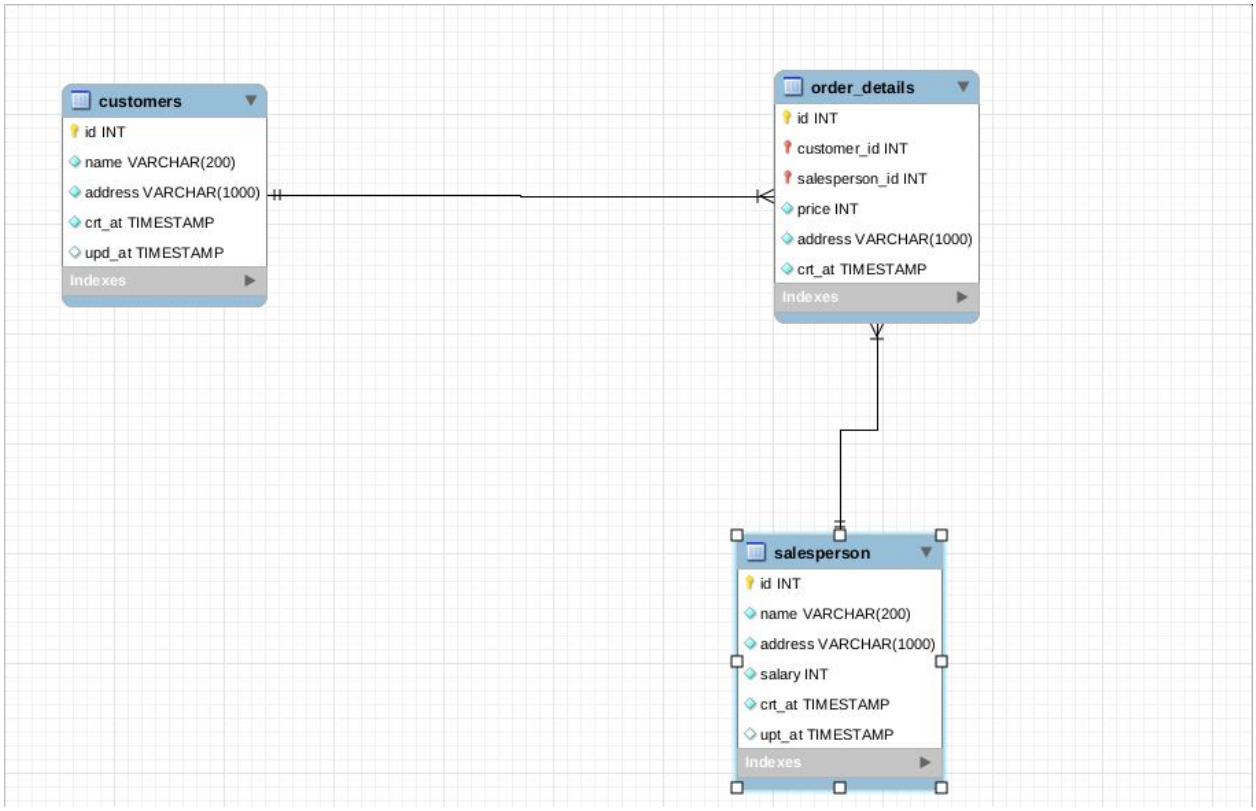


Design Schema

The Schema defines how a database should look like, what all relations are necessary for the database to work properly.

Here, the table *customers* is having customer details, the table *salesperson* is having details of the salesperson, and the table *order_details* is having the details for the order and both customer id and salesperson id as foreign keys from respective tables. Moreover, order id, salesperson id and customer id serve as a composite primary key in the table *order_details*.

Screenshot(s)



Create tables

We can create a table in mysl using the command *create table <table name> (<column_name> <data_type> <options>,....)*

Screenshot(s)

```
mysql> CREATE TABLE customers (
    -> id int not null auto_increment,
    -> name varchar(200) not null,
    -> address varchar(1000) not null,
    -> crt_at timestamp not null default current_timestamp,
    -> upt_at timestamp null default null on update current_timestamp,
    -> primary key(id)
    -> );
Query OK, 0 rows affected (0.30 sec)

mysql> desc customers
    -> ;
+---------+--------------+------+-----+-------------------+-----------------------------+
| Field   | Type         | Null | Key | Default           | Extra                       |
+---------+--------------+------+-----+-------------------+-----------------------------+
| id      | int(11)      | NO   | PRI | NULL              | auto_increment              |
| name    | varchar(200) | NO   |     | NULL              |                             |
| address | varchar(1000)| NO   |     | NULL              |                             |
| crt_at  | timestamp    | NO   |     | CURRENT_TIMESTAMP |                             |
| upt_at  | timestamp    | YES  |     | NULL              | on update CURRENT_TIMESTAMP |
+---------+--------------+------+-----+-------------------+-----------------------------+
5 rows in set (0.00 sec)
```

```
mysql> CREATE TABLE salesperson(
    -> id int not null auto_increment,
    -> name varchar(200) not null,
    -> address varchar(1000) not null,
    -> salary int not null,
    -> crt_at timestamp not null default current_timestamp,
    -> upt_at timestamp null default null on update current_timestamp,
    -> primary key (id)
    -> );
Query OK, 0 rows affected (0.27 sec)

mysql> desc salesperson
    -> ;
+---------+--------------+------+-----+-------------------+-----------------------------+
| Field   | Type         | Null | Key | Default           | Extra                       |
+---------+--------------+------+-----+-------------------+-----------------------------+
| id      | int(11)      | NO   | PRI | NULL              | auto_increment              |
| name    | varchar(200) | NO   |     | NULL              |                             |
| address | varchar(1000)| NO   |     | NULL              |                             |
| salary  | int(11)      | NO   |     | NULL              |                             |
| crt_at  | timestamp    | NO   |     | CURRENT_TIMESTAMP |                             |
| upt_at  | timestamp    | YES  |     | NULL              | on update CURRENT_TIMESTAMP |
+---------+--------------+------+-----+-------------------+-----------------------------+
6 rows in set (0.00 sec)
```

```
mysql> CREATE TABLE order_details (
    -> id int not null auto_increment,
    -> customer_id int not null,
    -> salesperson_id int not null,
    -> price int not null,
    -> address varchar(1000) not null,
    -> crt_at timestamp not null default current_timestamp,
    -> upt_at timestamp null default null on update current_timestamp,
    -> primary key (id, customer_id, salesperson_id),
    -> foreign key order_customer (customer_id) REFERENCES customers(id),
    -> foreign key order_salesperson (salesperson_id) REFERENCES salesperson(id)
    -> );
Query OK, 0 rows affected (0.44 sec)

mysql> desc order_detail;
ERROR 1146 (42S02): Table 'bootcamp.order_detail' doesn't exist
mysql> desc order_details;
+----------------+--------------+------+-----+-------------------+-----------------------------+
| Field          | Type         | Null | Key | Default           | Extra                       |
+----------------+--------------+------+-----+-------------------+-----------------------------+
| id             | int(11)      | NO   | PRI | NULL              | auto_increment              |
| customer_id    | int(11)      | NO   | PRI | NULL              |                             |
| salesperson_id | int(11)      | NO   | PRI | NULL              |                             |
| price          | int(11)      | NO   |     | NULL              |                             |
| address        | varchar(1000)| NO   |     | NULL              |                             |
| crt_at         | timestamp    | NO   |     | CURRENT_TIMESTAMP |                             |
| upt_at         | timestamp    | YES  |     | NULL              | on update CURRENT_TIMESTAMP |
+----------------+--------------+------+-----+-------------------+-----------------------------+
7 rows in set (0.00 sec)
```

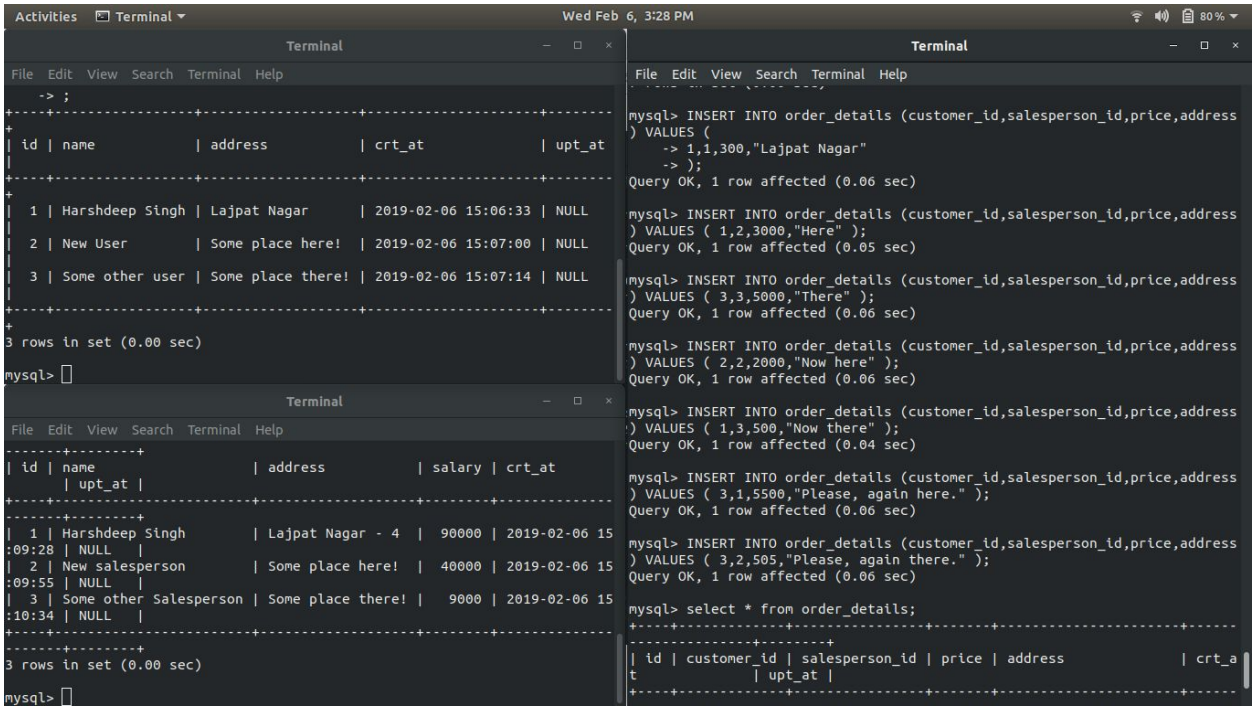
Insert sample data

Inserting sample data in all the tables, considering all the foreign key constraints.

Screenshot(s)

```
mysql> INSERT INTO customers (name, address) VALUES
    -> ("Harshdeep Singh", "Lajpat Nagar");
Query OK, 1 row affected (0.11 sec)

mysql> INSERT INTO customers (name, address) VALUES  ("New User", "Some place here!");
Query OK, 1 row affected (0.06 sec)

mysql> INSERT INTO customers (name, address) VALUES  ("Some other user", "Some place there!");
Query OK, 1 row affected (0.05 sec)

mysql> select * from customers
    -> ;
+----+-----------------+-------------------+---------------------+---------+
| id | name            | address           | crt_at              | upt_at |
+----+-----------------+-------------------+---------------------+---------+
|  1 | Harshdeep Singh | Lajpat Nagar      | 2019-02-06 15:06:33 | NULL   |
|  2 | New User        | Some place here!  | 2019-02-06 15:07:00 | NULL   |
|  3 | Some other user | Some place there! | 2019-02-06 15:07:14 | NULL   |
+----+-----------------+-------------------+---------------------+---------+
3 rows in set (0.00 sec)
```

```
mysql> ;INSERT INTO salesperson (name, address, salary) VALUES  ("Harshdeep Singh", "Lajpat Nagar - 4", 90000);
ERROR:
No query specified

Query OK, 1 row affected (0.04 sec)

mysql> ;INSERT INTO salesperson (name, address, salary) VALUES  ("New salesperson", "Some place here!", 40000);
ERROR:
No query specified

Query OK, 1 row affected (0.06 sec)

mysql> INSERT INTO salesperson (name, address, salary) VALUES  ("Some other Salesperson", "Some place there!", 9000);
Query OK, 1 row affected (0.06 sec)

mysql> select * from salesperson
    -> ;
+----+----------------------+------------------+--------+---------------------+---------+
| id | name                 | address          | salary | crt_at              | upt_at |
+----+----------------------+------------------+--------+---------------------+---------+
|  1 | Harshdeep Singh      | Lajpat Nagar - 4 |  90000 | 2019-02-06 15:09:28 | NULL   |
|  2 | New salesperson      | Some place here! |  40000 | 2019-02-06 15:09:55 | NULL   |
|  3 | Some other Salesperson | Some place there! |   9000 | 2019-02-06 15:10:34 | NULL   |
+----+----------------------+------------------+--------+---------------------+---------+
3 rows in set (0.00 sec)
```




```
mysql> select * from order_details;
+----+-------------+----------------+-------+----------------------+---------------------+---------+
| id | customer_id | salesperson_id | price | address              | crt_at              | upt_at  |
+----+-------------+----------------+-------+----------------------+---------------------+---------+
|  1 |           1 |              1 |   300 | Lajpat Nagar         | 2019-02-06 15:20:45 | NULL    |
|  2 |           1 |              2 |  3000 | Here                 | 2019-02-06 15:21:07 | NULL    |
|  3 |           3 |              3 |  5000 | There                | 2019-02-06 15:25:24 | NULL    |
|  4 |           2 |              2 |  2000 | Now here             | 2019-02-06 15:26:41 | NULL    |
|  5 |           1 |              3 |   500 | Now there            | 2019-02-06 15:26:53 | NULL    |
|  6 |           3 |              1 |  5500 | Please, again here.  | 2019-02-06 15:27:35 | NULL    |
|  7 |           3 |              2 |   505 | Please, again there. | 2019-02-06 15:27:48 | NULL    |
+----+-------------+----------------+-------+----------------------+---------------------+---------+
7 rows in set (0.00 sec)
```

Find the sales person have multiple orders.

The fuction *count()* return the number of records satisfying a particular condition.
Here, it is used to get the number of orders present for a particular salesperson.

Screenshot(s)

```
mysql> select * from order_details;
+----+-------------+----------------+-------+----------------------+---------------------+--------+
| id | customer_id | salesperson_id | price | address              | crt_at              | upt_at |
+----+-------------+----------------+-------+----------------------+---------------------+--------+
|  1 |           1 |              1 |   300 | Lajpat Nagar         | 2019-02-06 15:20:45 | NULL   |
|  2 |           1 |              2 |  3000 | Here                 | 2019-02-06 15:21:07 | NULL   |
|  3 |           3 |              3 |  5000 | There                | 2019-02-06 15:25:24 | NULL   |
|  4 |           2 |              2 |  2000 | Now here             | 2019-02-06 15:26:41 | NULL   |
|  5 |           1 |              3 |   500 | Now there            | 2019-02-06 15:26:53 | NULL   |
|  6 |           3 |              1 |  5500 | Please, again here.  | 2019-02-06 15:27:35 | NULL   |
|  9 |           3 |              2 |   505 | Please, again there. | 2019-02-06 15:38:12 | NULL   |
+----+-------------+----------------+-------+----------------------+---------------------+--------+
7 rows in set (0.00 sec)

mysql> delete from order_details where id = 6;
Query OK, 1 row affected (0.06 sec)

mysql> select * from order_details;
+----+-------------+----------------+-------+----------------------+---------------------+--------+
| id | customer_id | salesperson_id | price | address              | crt_at              | upt_at |
+----+-------------+----------------+-------+----------------------+---------------------+--------+
|  1 |           1 |              1 |   300 | Lajpat Nagar         | 2019-02-06 15:20:45 | NULL   |
|  2 |           1 |              2 |  3000 | Here                 | 2019-02-06 15:21:07 | NULL   |
|  3 |           3 |              3 |  5000 | There                | 2019-02-06 15:25:24 | NULL   |
|  4 |           2 |              2 |  2000 | Now here             | 2019-02-06 15:26:41 | NULL   |
|  5 |           1 |              3 |   500 | Now there            | 2019-02-06 15:26:53 | NULL   |
|  9 |           3 |              2 |   505 | Please, again there. | 2019-02-06 15:38:12 | NULL   |
+----+-------------+----------------+-------+----------------------+---------------------+--------+
6 rows in set (0.00 sec)
```

```
mysql> select * from salesperson sp where (select count(*) from order_details group by salesperson_id having salesperson_id=sp.id) > 1;
+----+-----------------------+------------------+--------+---------------------+--------+
| id | name                  | address          | salary | crt_at              | upt_at |
+----+-----------------------+------------------+--------+---------------------+--------+
|  2 | New salesperson       | Some place here! |  40000 | 2019-02-06 15:09:55 | NULL   |
|  3 | Some other Salesperson | Some place there! |   9000 | 2019-02-06 15:10:34 | NULL   |
+----+-----------------------+------------------+--------+---------------------+--------+
2 rows in set (0.00 sec)
```

Find the all sales person details along with order details

Inner Join creates a result set joining two tables on the basis of a common column, the foreign key.
A foreign key is a constraint which is used to link two tables, the primary key of the other table is made the foreign key of this table.

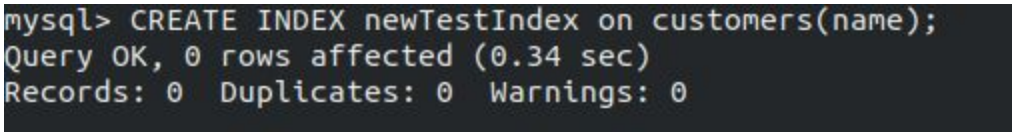
Screenshot(s)

```
mysql> SELECT
    -> salesperson.id Salesperson_ID,
    -> order_details.id Order_ID,
    -> name Salesperson_Name,
    -> order_details.address Delivery_Address,
    -> salesperson.address Salespersons_Address,
    -> salary Salary,
    -> price Order_Price
    -> FROM salesperson INNER JOIN order_details ON salesperson.id = order_details.salesperson_id;
+---------------+----------+-----------------------+---------------------+---------------------+--------+-------------+
| Salesperson_ID | Order_ID | Salesperson_Name      | Delivery_Address    | Salespersons_Address | Salary | Order_Price |
+---------------+----------+-----------------------+---------------------+---------------------+--------+-------------+
|              1 |        1 | Harshdeep Singh       | Lajpat Nagar        | Lajpat Nagar - 4    |  90000 |         300 |
|              2 |        2 | New salesperson       | Here                | Some place here!    |  40000 |        3000 |
|              3 |        3 | Some other Salesperson | There               | Some place there!   |   9000 |        5000 |
|              2 |        4 | New salesperson       | Now here            | Some place here!    |  40000 |        2000 |
|              3 |        5 | Some other Salesperson | Now there           | Some place there!   |   9000 |         500 |
|              2 |        9 | New salesperson       | Please, again there. | Some place here!    |  40000 |         505 |
+---------------+----------+-----------------------+---------------------+---------------------+--------+-------------+
6 rows in set (0.00 sec)
```

Create index

Index is also a kind of constraint we list with the mysql to make the *select* operation on the basis of that indexed column faster. Every key is an index.

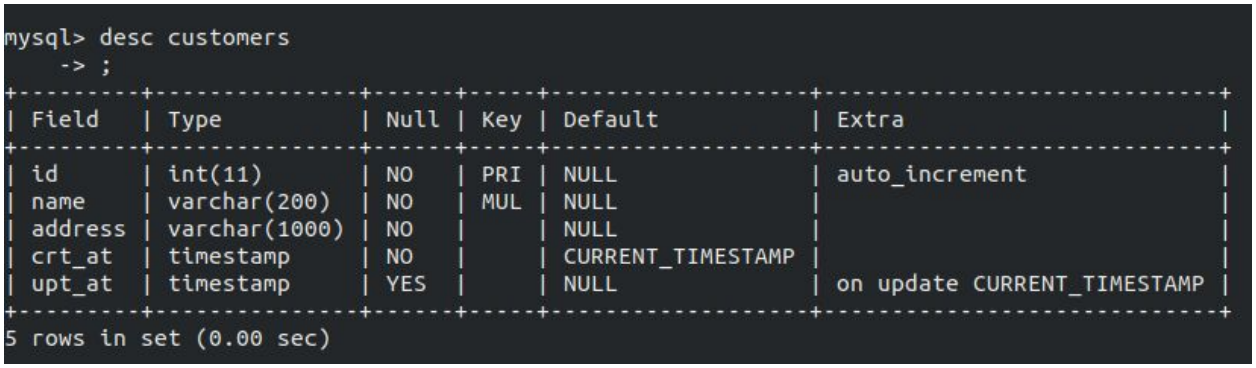
Screenshot(s)



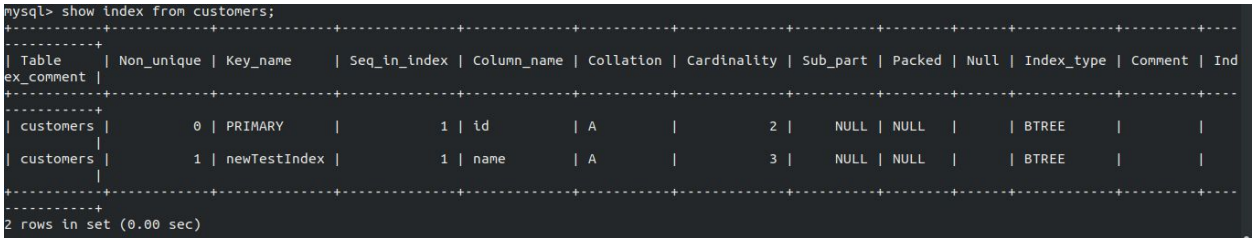
How to show index on a table

Show index from <table Name> is used to show all the indexes of a table.

Screenshot(s)



```
mysql> desc customers
    -> ;
+----------+---------------+------+-----+-------------------+-----------------------------+
| Field    | Type          | Null | Key | Default           | Extra                       |
+----------+---------------+------+-----+-------------------+-----------------------------+
| id       | int(11)       | NO   | PRI | NULL              | auto_increment              |
| name     | varchar(200)  | NO   | MUL | NULL              |                             |
| address  | varchar(1000) | NO   |     | NULL              |                             |
| crt_at   | timestamp     | NO   |     | CURRENT_TIMESTAMP |                             |
| upt_at   | timestamp     | YES  |     | NULL              | on update CURRENT_TIMESTAMP |
+----------+---------------+------+-----+-------------------+-----------------------------+
5 rows in set (0.00 sec)
```



```
mysql> show index from customers;
+-----------+------------+-------------+--------------+-------------+-----------+-------------+----------+--------+------+------------+---------+---
------------+
| Table     | Non_unique | Key_name    | Seq_in_index | Column_name | Collation | Cardinality | Sub_part | Packed | Null | Index_type | Comment | Ind
ex_comment |
+-----------+------------+-------------+--------------+-------------+-----------+-------------+----------+--------+------+------------+---------+---
------------+
| customers |          0 | PRIMARY     |            1 | id          | A         |           2 |     NULL | NULL   |      | BTREE      |         |
           |
| customers |          1 | newTestIndex |            1 | name        | A         |           3 |     NULL | NULL   |      | BTREE      |         |
           |
+-----------+------------+-------------+--------------+-------------+-----------+-------------+----------+--------+------+------------+---------+---
------------+
2 rows in set (0.00 sec)
```

Find the order number, sale person name, along with the customer to whom that order belongs to

Here we want data from all the three tables, *customers, salesperson* and *order_details*. Hence we're going to perform inner join on all the three tables.

Screenshot(s)

```
mysql> SELECT
    -> order_details.id Order_Name,
    -> salesperson.name Salesperson_Name,
    -> customers.name Customer_Name
    -> FROM
    -> order_details
    -> INNER JOIN customers ON customers.id = order_details.customer_id
    -> INNER JOIN salesperson ON salesperson.id = order_details.salesperson_id;
+------------+-----------------------+-----------------+
| Order_Name | Salesperson_Name      | Customer_Name   |
+------------+-----------------------+-----------------+
|          1 | Harshdeep Singh       | Harshdeep Singh |
|          2 | New salesperson       | Harshdeep Singh |
|          4 | New salesperson       | New User        |
|          9 | New salesperson       | Some other user |
|          5 | Some other Salesperson | Harshdeep Singh |
|          3 | Some other Salesperson | Some other user |
+------------+-----------------------+-----------------+
6 rows in set (0.00 sec)
```