Database Design
Self-Serve Dining System

CS157A
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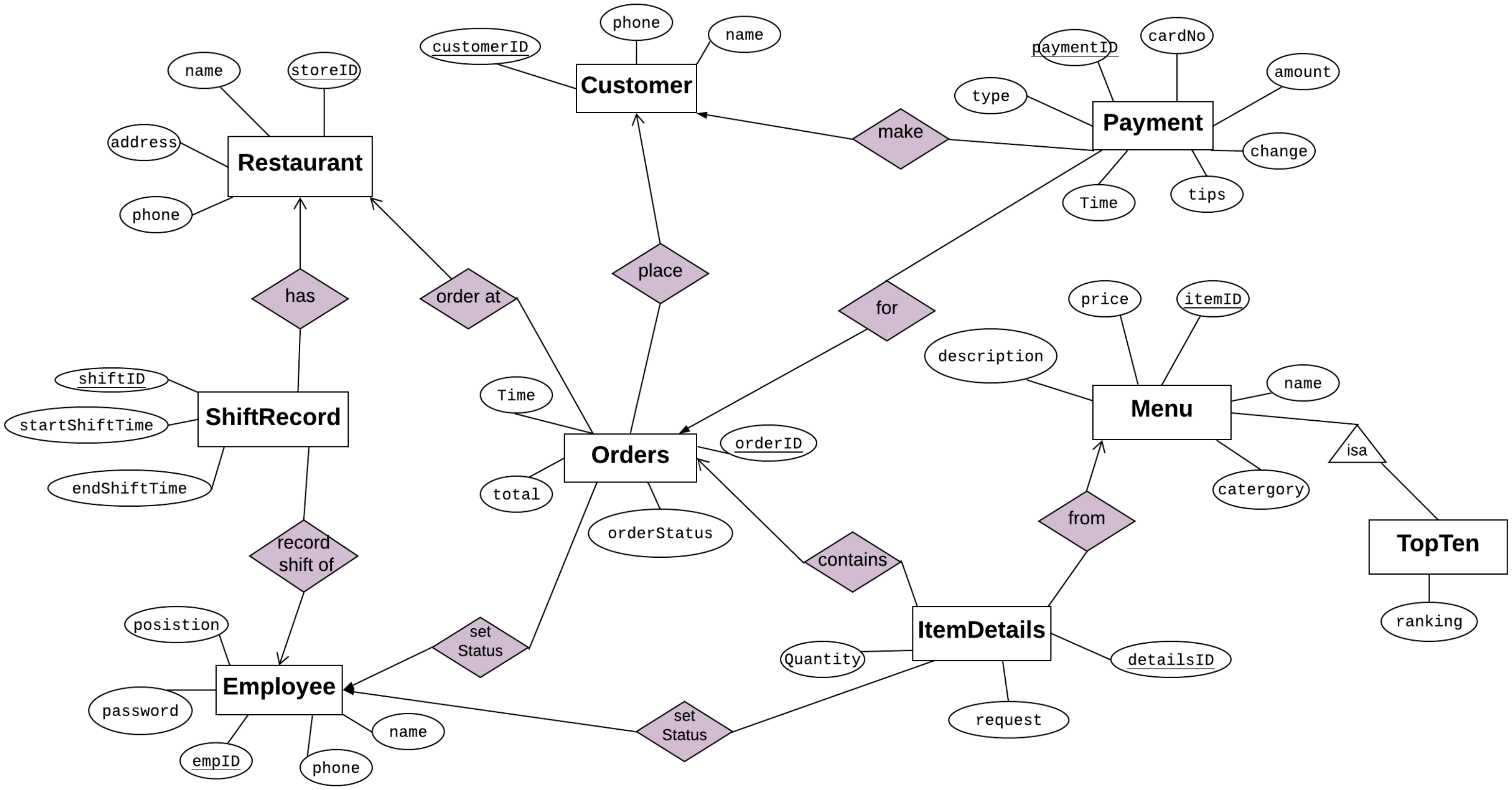
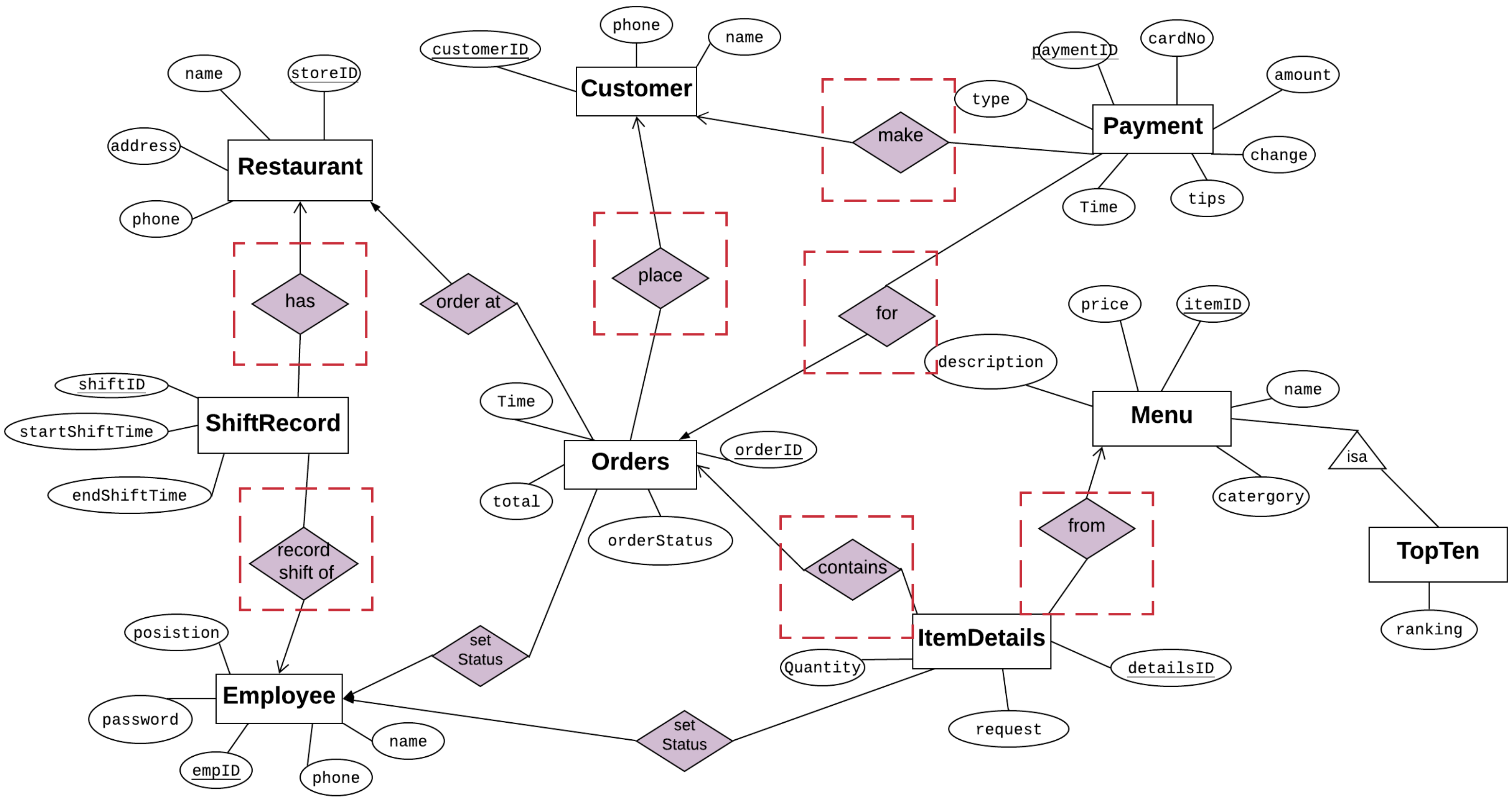
Self-order Dining System E/R Diagram



Self-order Dining System E/R Diagram



⬚ =combining relations in database Schema

Database Schema

Restaurant (storeID, name, address, phone)

Employee (empID, name, phone, position, password)

ShiftRecord (shiftID, startShiftTime, endShiftTime, storeID, empID)

Customer (customerID, name, phone)

Menu (itemID, name, description, category, price)

TopTen (itemID, ranking)

Orders (orderID, time, total, orderStatus, customerID)

ItemDetails (detailsID, orderID, itemID, Quantity, request)

Payment (paymentID, customerID, orderID, time, type, cardNo, amount, change, tips)

orderAt (orderID, storeID)

setOrderStatus (empID, orderID,time)

setItemDetailsStatus (empID, detailsID,time)

Description

In the E/R diagram, 7 of the relationships had combined with the “many” side of entities for easy access. Since the relationships will be access a lot. Including the primary key of “one” entity to “many” entity can reduce database access. The rest relationships has less significant use for the related entity. Thus they are stored as a separated table.

Relation Restaurant represents entity “Restaurant”. It records the location of the restaurant in case there are multiple locations. storeID is the primary, it also contains name, address and phone number as attributes of a tuple.

Relation Employee represents entity “Employee”. It is a table records a list of all employee in the restaurant who have access to the system. empID is the primary key. Password attribute contains the password of employee to use for identification. Position will determine access level the system (e.g. admin/regular staff).

Relation ShiftRecord represents entity “ShiftRecord”, relationship “has” and relationship “record shift of”. It records the workhours of employee. This relation is combining the many to 1 relationship to relation Employee and the many to 1 relationship to relation Restaurant. One restaurant has multiple shift record. One employee has multiple shift record. A shift record records exact one employee at exact one restaurant. storeID and empID as foreign key are included to combine relationships.

Relation Customer represent entity “customer”. record the identity of customer. It contains a unique ID, name and phone no. of customer.

Relation Menu represents entity “Menu”. It records all food item sell in the restaurant. It contains itemID as primary, name, price, category and description of food as attributes. Category refers to appetizer, main course, drinks, etc.

Relation TopTen is the subclass of relation Menu. It records the top ten order item from the menu. It contains ranking# as a attribute.

Relation Orders represents entity “Orders”. It records the food order place by customers. It combines the many to 1 relationship to relation Customer. One customer makes multiple orders and an order is placed by exactly one customer. customerID as foreign key are included to combine this relationship.

Relation ItemDetails represents entity “ItemDetails”, relationship “contains” and relationship “from”. It records the content of each order from an item in menu. This relation is combining the many to 1 relationship to relation Orders and the many to 1 relationship to relation Menu. One order has multiple ItemDetails. One menu item has multiple ItemDetails from different orders. An ItemDetails records exact one menu item ordered in exact one Orders. orderID and itemID as foreign key are included to combine relationships. Request is the attribute store orders special request such as less salt in the food order.

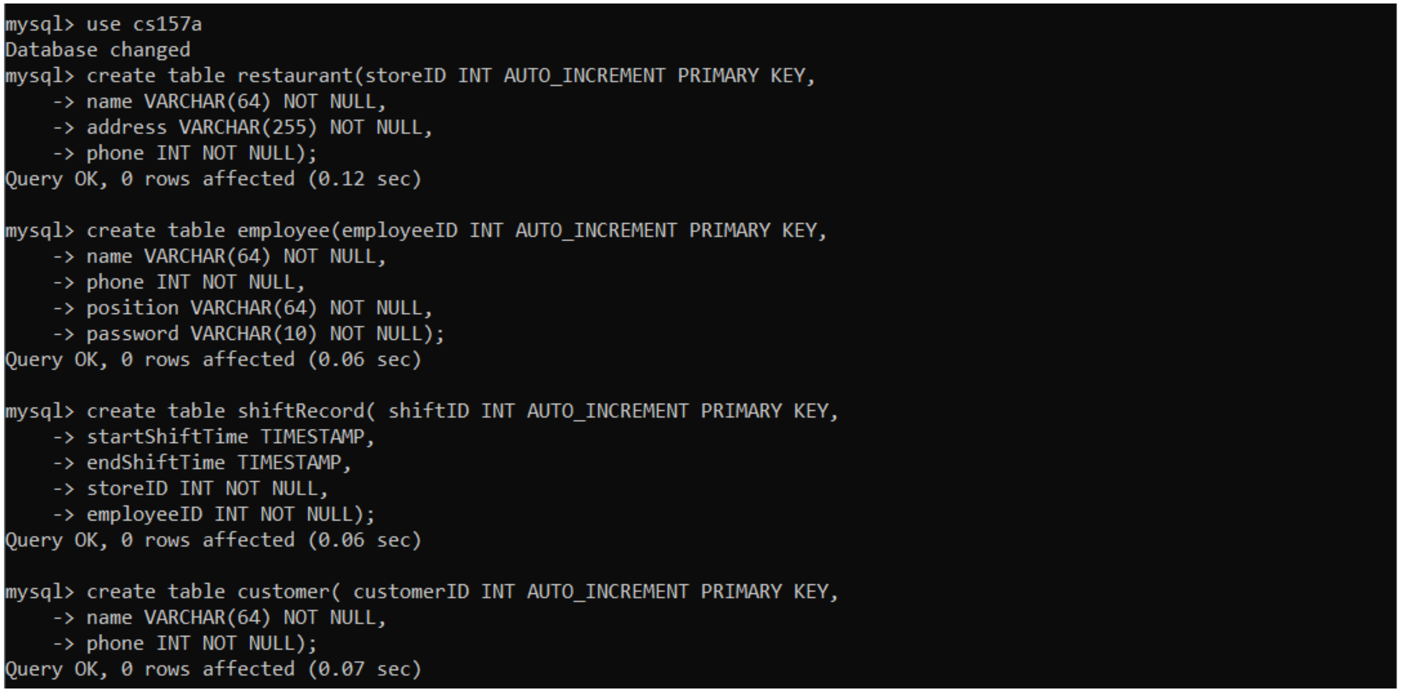
Relation payment represents entity “Payment”, relationship “make” and relationship “for”. record the payment details from customers for an order. This relation is combining the many to 1 relationship to relation Orders and the many to 1 relationship to relation Customer. One order can have multiple payments (partial payments). One customer can make multiple payments from different orders. A payment records exact one customer’s payment for exact one order. orderID and customerID as foreign key are included to combine these relationships. type is the attribute store types of payment such as cash or visa.

Relation orderAt represents relationship “order at”. It contains primary key of restaurant relation and orders relation. storeID and orderID is the primary key of this relation. It Records the restaurant location of each order.

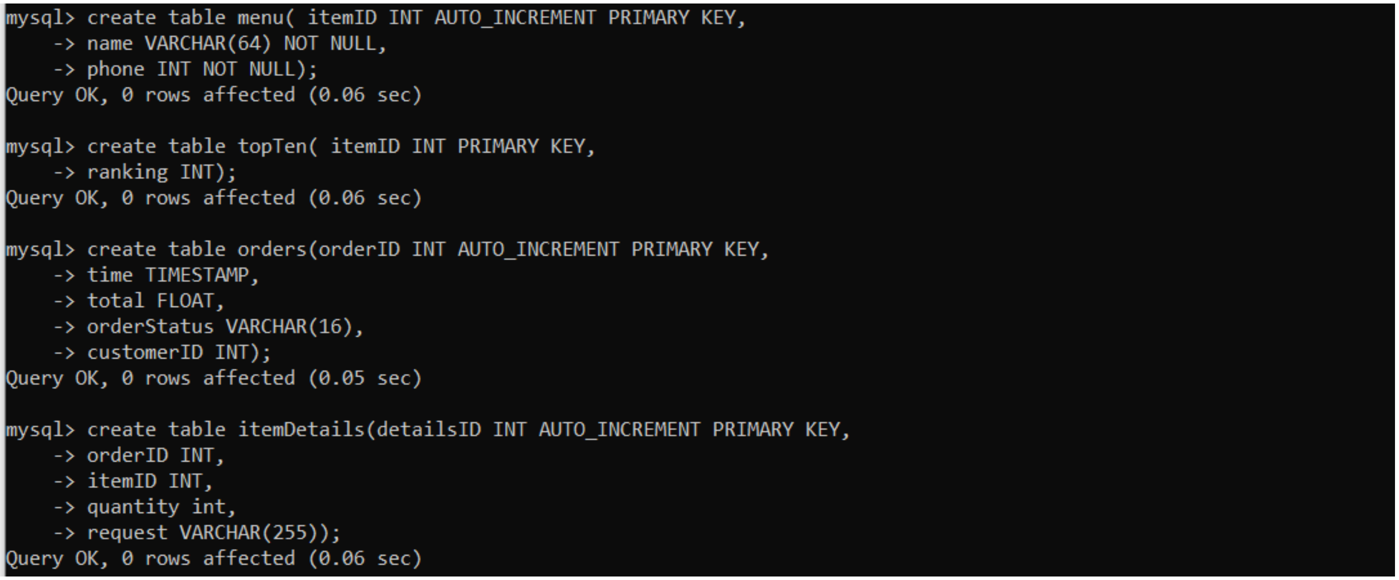
Relation setOrderStatus represents relationship “set status”. It contains primary key of employee relation and orders relation. empID and orderID is the primary key of this relation. It Records the which customer service employee set the entire order complete.

Relation setItemDetailsStatus represents relationship “set status”. It contains primary key of employee relation and ItemDetails relation. empID and detailsID is the primary key of this relation. It Records the which kitchen employee prepare an item from an order.

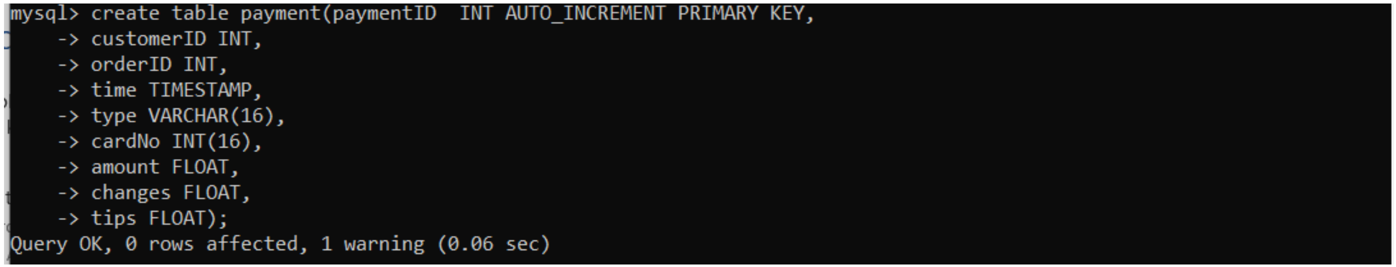
Create Table Results



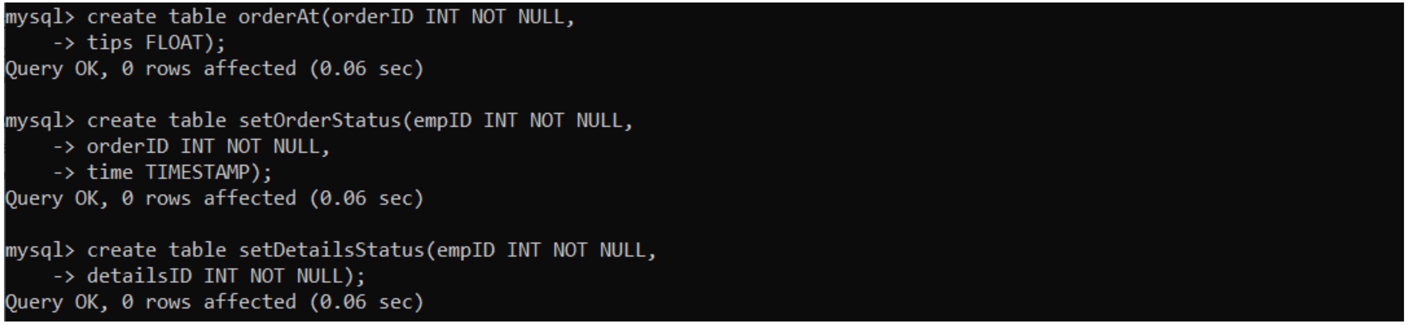
```
mysql> use cs157a
Database changed
mysql> create table restaurant(storeID INT AUTO_INCREMENT PRIMARY KEY,
    -> name VARCHAR(64) NOT NULL,
    -> address VARCHAR(255) NOT NULL,
    -> phone INT NOT NULL);
Query OK, 0 rows affected (0.12 sec)

mysql> create table employee(employeeID INT AUTO_INCREMENT PRIMARY KEY,
    -> name VARCHAR(64) NOT NULL,
    -> phone INT NOT NULL,
    -> position VARCHAR(64) NOT NULL,
    -> password VARCHAR(10) NOT NULL);
Query OK, 0 rows affected (0.06 sec)

mysql> create table shiftRecord( shiftID INT AUTO_INCREMENT PRIMARY KEY,
    -> startShiftTime TIMESTAMP,
    -> endShiftTime TIMESTAMP,
    -> storeID INT NOT NULL,
    -> employeeID INT NOT NULL);
Query OK, 0 rows affected (0.06 sec)

mysql> create table customer( customerID INT AUTO_INCREMENT PRIMARY KEY,
    -> name VARCHAR(64) NOT NULL,
    -> phone INT NOT NULL);
Query OK, 0 rows affected (0.07 sec)
```



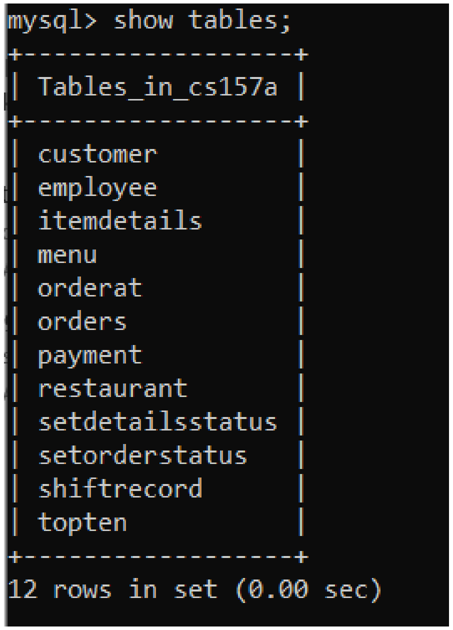
```
mysql> create table menu( itemID INT AUTO_INCREMENT PRIMARY KEY,
    -> name VARCHAR(64) NOT NULL,
    -> phone INT NOT NULL);
Query OK, 0 rows affected (0.06 sec)

mysql> create table topTen( itemID INT PRIMARY KEY,
    -> ranking INT);
Query OK, 0 rows affected (0.06 sec)

mysql> create table orders(orderID INT AUTO_INCREMENT PRIMARY KEY,
    -> time TIMESTAMP,
    -> total FLOAT,
    -> orderStatus VARCHAR(16),
    -> customerID INT);
Query OK, 0 rows affected (0.05 sec)

mysql> create table itemDetails(detailsID INT AUTO_INCREMENT PRIMARY KEY,
    -> orderID INT,
    -> itemID INT,
    -> quantity int,
    -> request VARCHAR(255));
Query OK, 0 rows affected (0.06 sec)
```



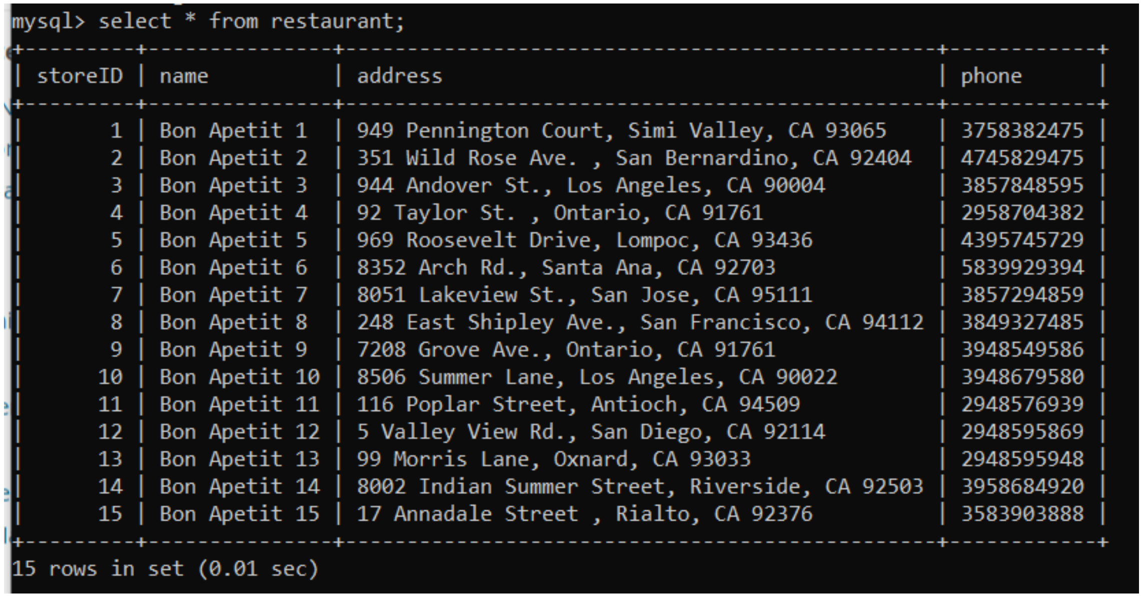
```
mysql> create table payment(paymentID  INT AUTO_INCREMENT PRIMARY KEY,
    -> customerID INT,
    -> orderID INT,
    -> time TIMESTAMP,
    -> type VARCHAR(16),
    -> cardNo INT(16),
    -> amount FLOAT,
    -> changes FLOAT,
    -> tips FLOAT);
Query OK, 0 rows affected, 1 warning (0.06 sec)
```



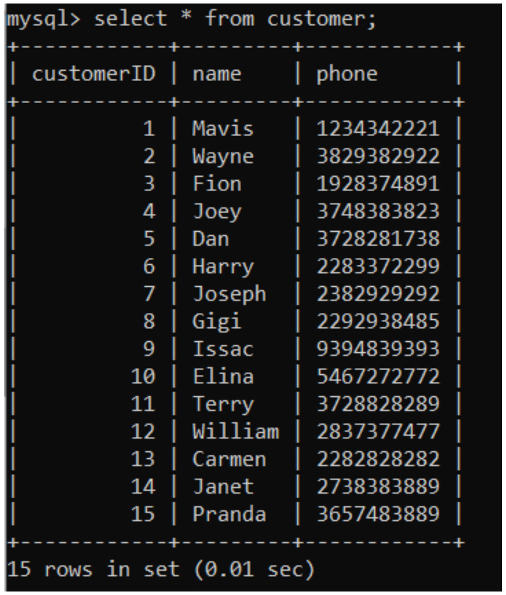
```
mysql> create table orderAt(orderID INT NOT NULL,
    -> tips FLOAT);
Query OK, 0 rows affected (0.06 sec)

mysql> create table setOrderStatus(empID INT NOT NULL,
    -> orderID INT NOT NULL,
    -> time TIMESTAMP);
Query OK, 0 rows affected (0.06 sec)

mysql> create table setDetailsStatus(empID INT NOT NULL,
    -> detailsID INT NOT NULL);
Query OK, 0 rows affected (0.06 sec)
```



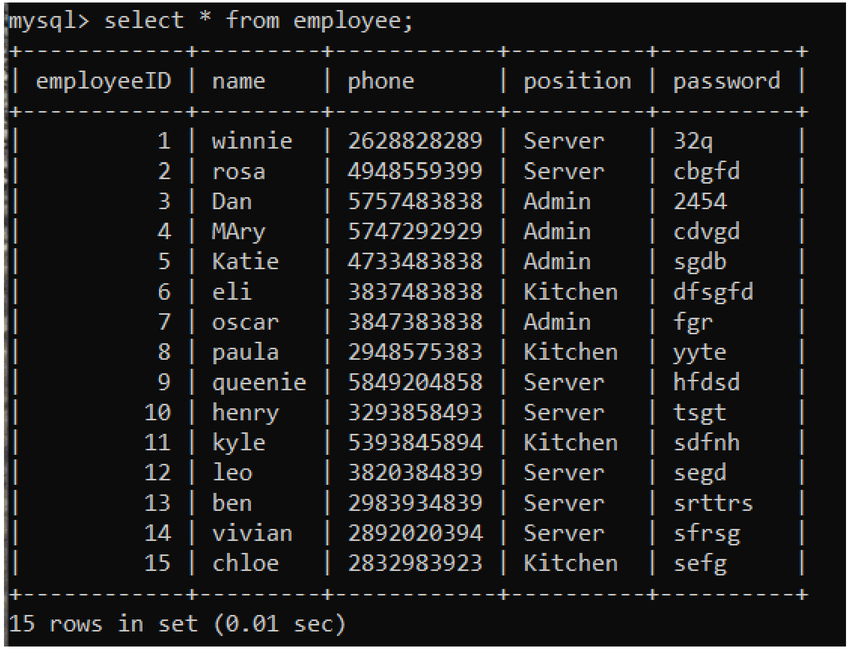
```
mysql> show tables;
+------------------+
| Tables_in_cs157a |
+------------------+
| customer         |
| employee         |
| itemdetails      |
| menu             |
| orderat          |
| orders           |
| payment          |
| restaurant       |
| setdetailsstatus |
| setorderstatus   |
| shiftrecord      |
| topten           |
+------------------+
12 rows in set (0.00 sec)
```



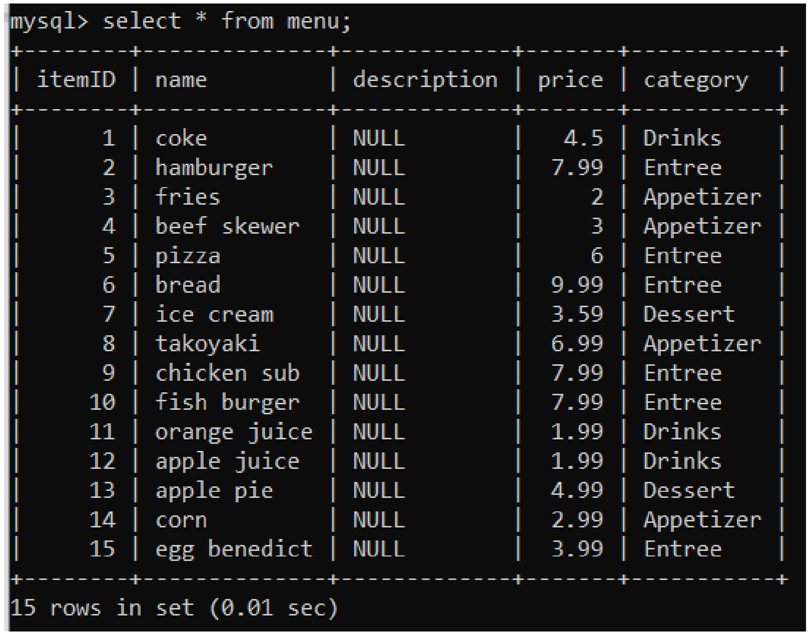
```
mysql> select * from restaurant;
+---------+---------------+------------------------------------------------+------------+
| storeID | name          | address                                        | phone      |
+---------+---------------+------------------------------------------------+------------+
|       1 | Bon Apetit 1  | 949 Pennington Court, Simi Valley, CA 93065    | 3758382475 |
|       2 | Bon Apetit 2  | 351 Wild Rose Ave. , San Bernardino, CA 92404  | 4745829475 |
|       3 | Bon Apetit 3  | 944 Andover St., Los Angeles, CA 90004         | 3857848595 |
|       4 | Bon Apetit 4  | 92 Taylor St. , Ontario, CA 91761              | 2958704382 |
|       5 | Bon Apetit 5  | 969 Roosevelt Drive, Lompoc, CA 93436          | 4395745729 |
|       6 | Bon Apetit 6  | 8352 Arch Rd., Santa Ana, CA 92703             | 5839929394 |
|       7 | Bon Apetit 7  | 8051 Lakeview St., San Jose, CA 95111          | 3857294859 |
|       8 | Bon Apetit 8  | 248 East Shipley Ave., San Francisco, CA 94112 | 3849327485 |
|       9 | Bon Apetit 9  | 7208 Grove Ave., Ontario, CA 91761             | 3948549586 |
|      10 | Bon Apetit 10 | 8506 Summer Lane, Los Angeles, CA 90022        | 3948679580 |
|      11 | Bon Apetit 11 | 116 Poplar Street, Antioch, CA 94509           | 2948576939 |
|      12 | Bon Apetit 12 | 5 Valley View Rd., San Diego, CA 92114         | 2948595869 |
|      13 | Bon Apetit 13 | 99 Morris Lane, Oxnard, CA 93033               | 2948595948 |
|      14 | Bon Apetit 14 | 8002 Indian Summer Street, Riverside, CA 92503 | 3958684920 |
|      15 | Bon Apetit 15 | 17 Annadale Street , Rialto, CA 92376          | 3583903888 |
+---------+---------------+------------------------------------------------+------------+
15 rows in set (0.01 sec)
```



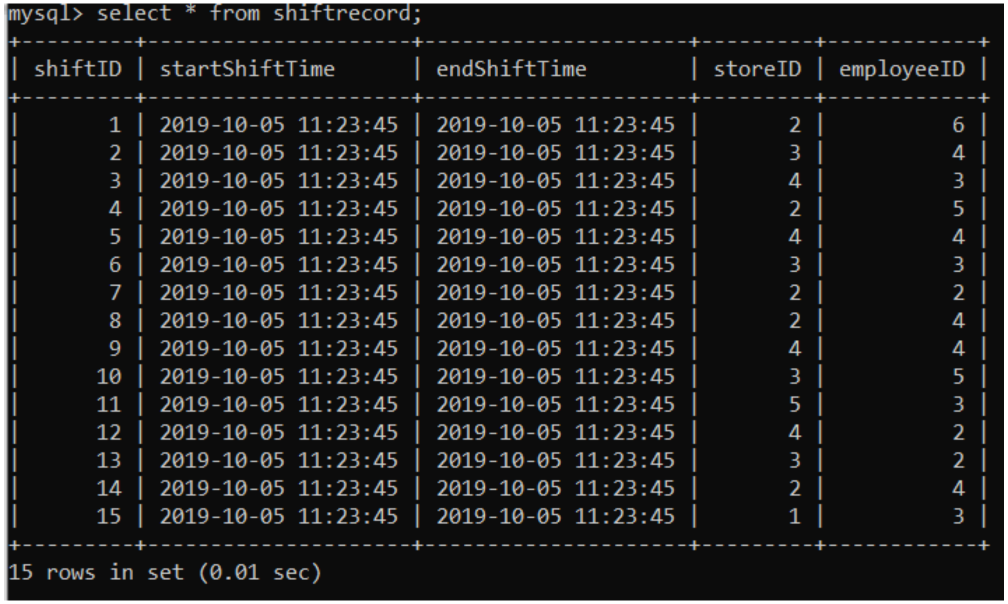
```
mysql> select * from customer;
+------------+---------+------------+
| customerID | name    | phone      |
+------------+---------+------------+
|          1 | Mavis   | 1234342221 |
|          2 | Wayne   | 3829382922 |
|          3 | Fion    | 1928374891 |
|          4 | Joey    | 3748383823 |
|          5 | Dan     | 3728281738 |
|          6 | Harry   | 2283372299 |
|          7 | Joseph  | 2382929292 |
|          8 | Gigi    | 2292938485 |
|          9 | Issac   | 9394839393 |
|         10 | Elina   | 5467272772 |
|         11 | Terry   | 3728828289 |
|         12 | William | 2837377477 |
|         13 | Carmen  | 2282828282 |
|         14 | Janet   | 2738383889 |
|         15 | Pranda  | 3657483889 |
+------------+---------+------------+
15 rows in set (0.01 sec)
```



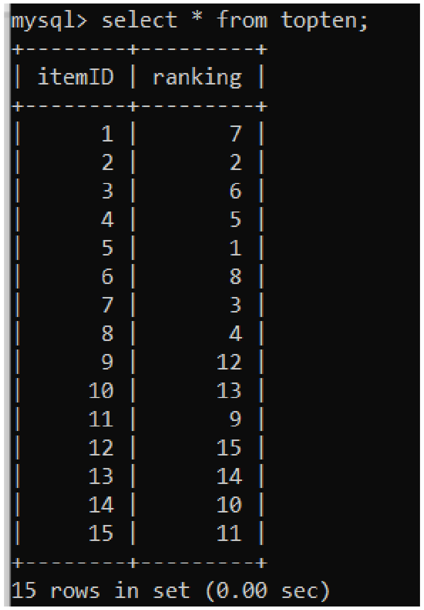
```
mysql> select * from employee;
+------------+---------+------------+----------+----------+
| employeeID | name    | phone      | position | password |
+------------+---------+------------+----------+----------+
|          1 | winnie  | 2628828289 | Server   | 32q      |
|          2 | rosa    | 4948559399 | Server   | cbgfd    |
|          3 | Dan     | 5757483838 | Admin    | 2454     |
|          4 | MAry    | 5747292929 | Admin    | cdvgd    |
|          5 | Katie   | 4733483838 | Admin    | sgdb     |
|          6 | eli     | 3837483838 | Kitchen  | dfsgfd   |
|          7 | oscar   | 3847383838 | Admin    | fgr      |
|          8 | paula   | 2948575383 | Kitchen  | yyte     |
|          9 | queenie | 5849204858 | Server   | hfdsd    |
|         10 | henry   | 3293858493 | Server   | tsgt     |
|         11 | kyle    | 5393845894 | Kitchen  | sdfnh    |
|         12 | leo     | 3820384839 | Server   | segd     |
|         13 | ben     | 2983934839 | Server   | srttrs   |
|         14 | vivian  | 2892020394 | Server   | sfrsg    |
|         15 | chloe   | 2832983923 | Kitchen  | sefg     |
+------------+---------+------------+----------+----------+
15 rows in set (0.01 sec)
```



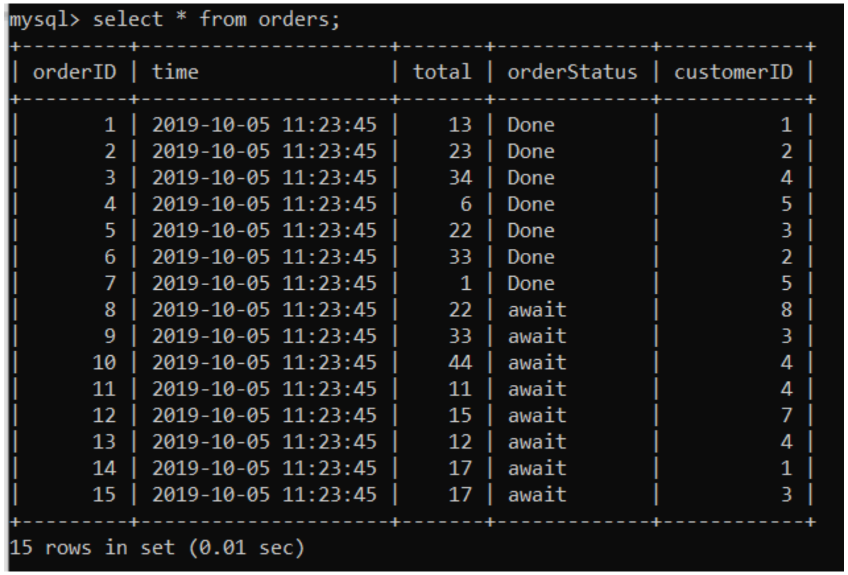
```
mysql> select * from menu;
+--------+--------------+-------------+-------+-----------+
| itemID | name         | description | price | category  |
+--------+--------------+-------------+-------+-----------+
|      1 | coke         | NULL        |   4.5 | Drinks    |
|      2 | hamburger    | NULL        |  7.99 | Entree    |
|      3 | fries        | NULL        |     2 | Appetizer |
|      4 | beef skewer  | NULL        |     3 | Appetizer |
|      5 | pizza        | NULL        |     6 | Entree    |
|      6 | bread        | NULL        |  9.99 | Entree    |
|      7 | ice cream    | NULL        |  3.59 | Dessert   |
|      8 | takoyaki     | NULL        |  6.99 | Appetizer |
|      9 | chicken sub  | NULL        |  7.99 | Entree    |
|     10 | fish burger  | NULL        |  7.99 | Entree    |
|     11 | orange juice | NULL        |  1.99 | Drinks    |
|     12 | apple juice  | NULL        |  1.99 | Drinks    |
|     13 | apple pie    | NULL        |  4.99 | Dessert   |
|     14 | corn         | NULL        |  2.99 | Appetizer |
|     15 | egg benedict | NULL        |  3.99 | Entree    |
+--------+--------------+-------------+-------+-----------+
15 rows in set (0.01 sec)
```



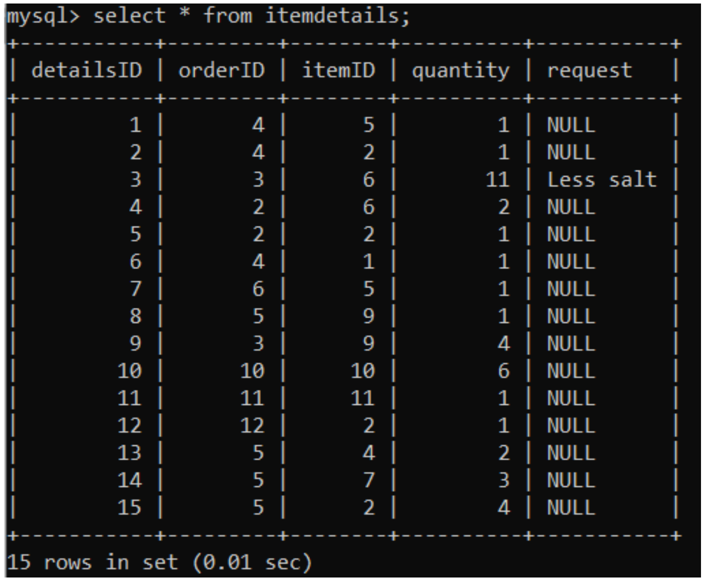
```
mysql> select * from shiftrecord;
+---------+---------------------+---------------------+---------+------------+
| shiftID | startShiftTime      | endShiftTime        | storeID | employeeID |
+---------+---------------------+---------------------+---------+------------+
|       1 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       2 |          6 |
|       2 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       3 |          4 |
|       3 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       4 |          3 |
|       4 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       2 |          5 |
|       5 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       4 |          4 |
|       6 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       3 |          3 |
|       7 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       2 |          2 |
|       8 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       2 |          4 |
|       9 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       4 |          4 |
|      10 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       3 |          5 |
|      11 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       5 |          3 |
|      12 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       4 |          2 |
|      13 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       3 |          2 |
|      14 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       2 |          4 |
|      15 | 2019-10-05 11:23:45 | 2019-10-05 11:23:45 |       1 |          3 |
+---------+---------------------+---------------------+---------+------------+
15 rows in set (0.01 sec)
```



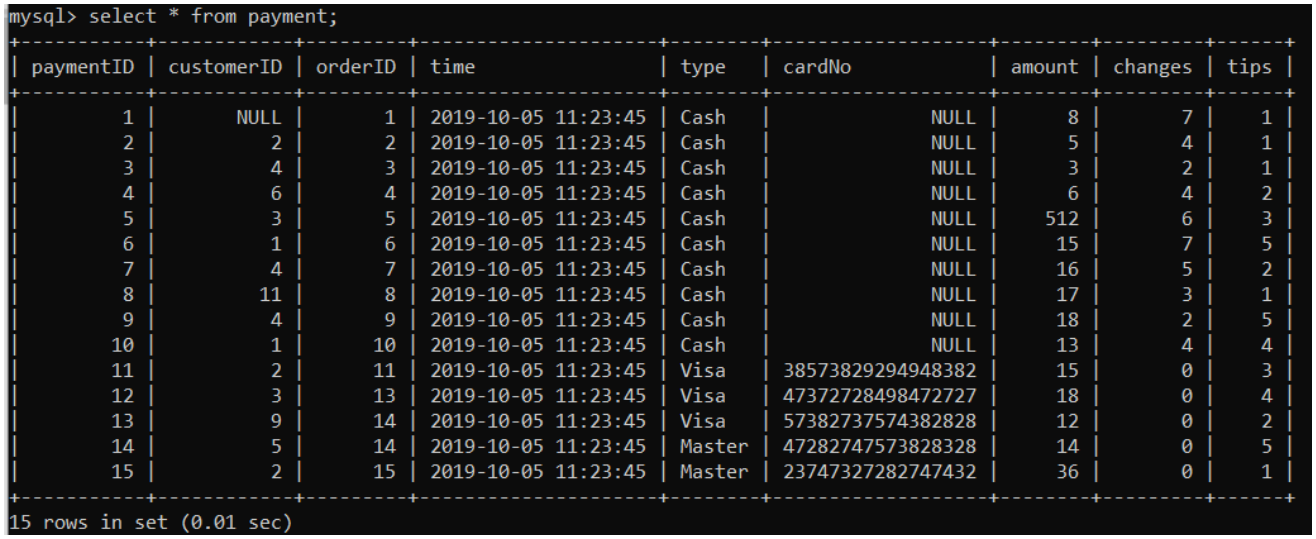
```
mysql> select * from topten;
+--------+---------+
| itemID | ranking |
+--------+---------+
|      1 |       7 |
|      2 |       2 |
|      3 |       6 |
|      4 |       5 |
|      5 |       1 |
|      6 |       8 |
|      7 |       3 |
|      8 |       4 |
|      9 |      12 |
|     10 |      13 |
|     11 |       9 |
|     12 |      15 |
|     13 |      14 |
|     14 |      10 |
|     15 |      11 |
+--------+---------+
15 rows in set (0.00 sec)
```



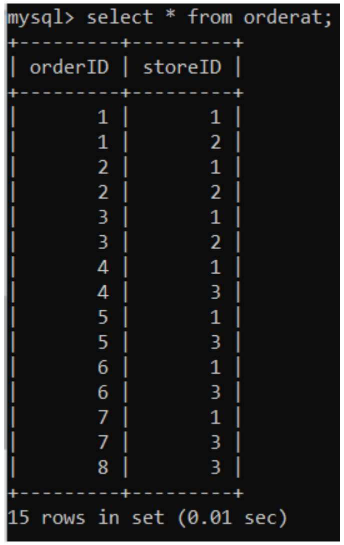
```
mysql> select * from orders;
+---------+---------------------+-------+-------------+------------+
| orderID | time                | total | orderStatus | customerID |
+---------+---------------------+-------+-------------+------------+
|       1 | 2019-10-05 11:23:45 |    13 | Done        |          1 |
|       2 | 2019-10-05 11:23:45 |    23 | Done        |          2 |
|       3 | 2019-10-05 11:23:45 |    34 | Done        |          4 |
|       4 | 2019-10-05 11:23:45 |     6 | Done        |          5 |
|       5 | 2019-10-05 11:23:45 |    22 | Done        |          3 |
|       6 | 2019-10-05 11:23:45 |    33 | Done        |          2 |
|       7 | 2019-10-05 11:23:45 |     1 | Done        |          5 |
|       8 | 2019-10-05 11:23:45 |    22 | await       |          8 |
|       9 | 2019-10-05 11:23:45 |    33 | await       |          3 |
|      10 | 2019-10-05 11:23:45 |    44 | await       |          4 |
|      11 | 2019-10-05 11:23:45 |    11 | await       |          4 |
|      12 | 2019-10-05 11:23:45 |    15 | await       |          7 |
|      13 | 2019-10-05 11:23:45 |    12 | await       |          4 |
|      14 | 2019-10-05 11:23:45 |    17 | await       |          1 |
|      15 | 2019-10-05 11:23:45 |    17 | await       |          3 |
+---------+---------------------+-------+-------------+------------+
15 rows in set (0.01 sec)
```



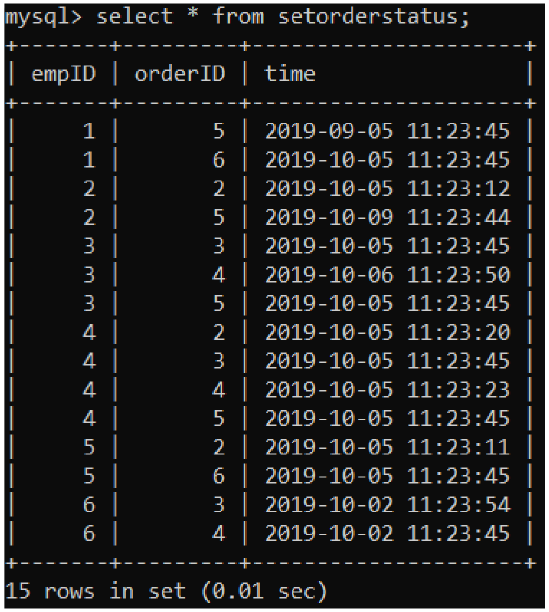
```
mysql> select * from itemdetails;
+-----------+---------+--------+----------+-----------+
| detailsID | orderID | itemID | quantity | request   |
+-----------+---------+--------+----------+-----------+
|         1 |       4 |      5 |        1 | NULL      |
|         2 |       4 |      2 |        1 | NULL      |
|         3 |       3 |      6 |       11 | Less salt |
|         4 |       2 |      6 |        2 | NULL      |
|         5 |       2 |      2 |        1 | NULL      |
|         6 |       4 |      1 |        1 | NULL      |
|         7 |       6 |      5 |        1 | NULL      |
|         8 |       5 |      9 |        1 | NULL      |
|         9 |       3 |      9 |        4 | NULL      |
|        10 |      10 |     10 |        6 | NULL      |
|        11 |      11 |     11 |        1 | NULL      |
|        12 |      12 |      2 |        1 | NULL      |
|        13 |       5 |      4 |        2 | NULL      |
|        14 |       5 |      7 |        3 | NULL      |
|        15 |       5 |      2 |        4 | NULL      |
+-----------+---------+--------+----------+-----------+
15 rows in set (0.01 sec)
```



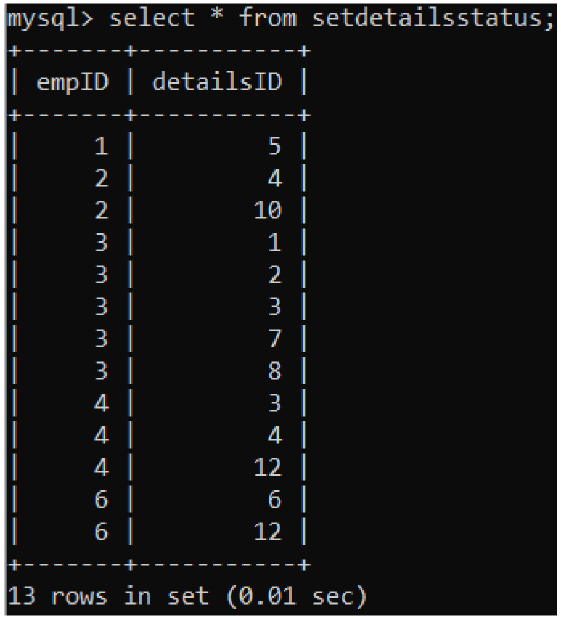
```
mysql> select * from payment;
+-----------+------------+---------+---------------------+--------+-------------------+--------+---------+------+
| paymentID | customerID | orderID | time                | type   | cardNo            | amount | changes | tips |
+-----------+------------+---------+---------------------+--------+-------------------+--------+---------+------+
|         1 |       NULL |       1 | 2019-10-05 11:23:45 | Cash   |              NULL |      8 |       7 |    1 |
|         2 |          2 |       2 | 2019-10-05 11:23:45 | Cash   |              NULL |      5 |       4 |    1 |
|         3 |          4 |       3 | 2019-10-05 11:23:45 | Cash   |              NULL |      3 |       2 |    1 |
|         4 |          6 |       4 | 2019-10-05 11:23:45 | Cash   |              NULL |      6 |       4 |    2 |
|         5 |          3 |       5 | 2019-10-05 11:23:45 | Cash   |              NULL |    512 |       6 |    3 |
|         6 |          1 |       6 | 2019-10-05 11:23:45 | Cash   |              NULL |     15 |       7 |    5 |
|         7 |          4 |       7 | 2019-10-05 11:23:45 | Cash   |              NULL |     16 |       5 |    2 |
|         8 |         11 |       8 | 2019-10-05 11:23:45 | Cash   |              NULL |     17 |       3 |    1 |
|         9 |          4 |       9 | 2019-10-05 11:23:45 | Cash   |              NULL |     18 |       2 |    5 |
|        10 |          1 |      10 | 2019-10-05 11:23:45 | Cash   |              NULL |     13 |       4 |    4 |
|        11 |          2 |      11 | 2019-10-05 11:23:45 | Visa   | 38573829294948382 |     15 |       0 |    3 |
|        12 |          3 |      13 | 2019-10-05 11:23:45 | Visa   | 47372728498472727 |     18 |       0 |    4 |
|        13 |          9 |      14 | 2019-10-05 11:23:45 | Visa   | 57382737574382828 |     12 |       0 |    2 |
|        14 |          5 |      14 | 2019-10-05 11:23:45 | Master | 47282747573828328 |     14 |       0 |    5 |
|        15 |          2 |      15 | 2019-10-05 11:23:45 | Master | 23747327282747432 |     36 |       0 |    1 |
+-----------+------------+---------+---------------------+--------+-------------------+--------+---------+------+
15 rows in set (0.01 sec)
```



```
mysql> select * from orderat;
+---------+---------+
| orderID | storeID |
+---------+---------+
|       1 |       1 |
|       1 |       2 |
|       2 |       1 |
|       2 |       2 |
|       3 |       1 |
|       3 |       2 |
|       4 |       1 |
|       4 |       3 |
|       5 |       1 |
|       5 |       3 |
|       6 |       1 |
|       6 |       3 |
|       7 |       1 |
|       7 |       3 |
|       8 |       3 |
+---------+---------+
15 rows in set (0.01 sec)
```



```
mysql> select * from setorderstatus;
+-------+---------+---------------------+
| empID | orderID | time                |
+-------+---------+---------------------+
|     1 |       5 | 2019-09-05 11:23:45 |
|     1 |       6 | 2019-10-05 11:23:45 |
|     2 |       2 | 2019-10-05 11:23:12 |
|     2 |       5 | 2019-10-09 11:23:44 |
|     3 |       3 | 2019-10-05 11:23:45 |
|     3 |       4 | 2019-10-06 11:23:50 |
|     3 |       5 | 2019-10-05 11:23:45 |
|     4 |       2 | 2019-10-05 11:23:20 |
|     4 |       3 | 2019-10-05 11:23:45 |
|     4 |       4 | 2019-10-05 11:23:23 |
|     4 |       5 | 2019-10-05 11:23:45 |
|     5 |       2 | 2019-10-05 11:23:11 |
|     5 |       6 | 2019-10-05 11:23:45 |
|     6 |       3 | 2019-10-02 11:23:54 |
|     6 |       4 | 2019-10-02 11:23:45 |
+-------+---------+---------------------+
15 rows in set (0.01 sec)
```



```
mysql> select * from setdetailsstatus;
+-------+-----------+
| empID | detailsID |
+-------+-----------+
|     1 |         5 |
|     2 |         4 |
|     2 |        10 |
|     3 |         1 |
|     3 |         2 |
|     3 |         3 |
|     3 |         7 |
|     3 |         8 |
|     4 |         3 |
|     4 |         4 |
|     4 |        12 |
|     6 |         6 |
|     6 |        12 |
+-------+-----------+
13 rows in set (0.01 sec)
```