CSE370 : DATABASE SYSTEMS

LAB HOMEWORK - 4

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SECTION : 05

```
MariaDB [(none)]> create database Bank;
Query OK, 1 row affected (0.003 sec)

MariaDB [(none)]> use Bank;
Database changed
MariaDB [Bank]> create table customer (
    -> customer_id varchar(10) not null,
    -> customer_name varchar(20) not null,
    -> customer_street varchar(30),
    -> customer_city varchar(30),
    -> primary key (customer_id));
Query OK, 0 rows affected (0.051 sec)

MariaDB [Bank]> insert into customer values ('C-101','Jones', 'Main', 'Harrison'), ('C-201','Smith', 'North', 'Rye'),('C-211','Hayes', 'Main', 'Harrison'), ('C-212','Curry'
, 'North', 'Rye'),('C-215','Lindsay', 'Park', 'Pittsfield'),('C-220','Turner', 'Putnam', 'Stamford'),('C-222','Williams', 'Nassau', 'Princeton'),('C-225','Adams', 'Spring',
 'Pittsfield'),('C-226','Johnson', 'Alma', 'Palo Alto'),('C-233','Glenn', 'Sand Hill', 'Woodside'),('C-234','Brooks', 'Senator', 'Brooklyn'),('C-255','Green', 'Walnut', 'St
amford');
Query OK, 12 rows affected (0.024 sec)
Records: 12  Duplicates: 0  Warnings: 0

MariaDB [Bank]> select * from customer;
+-------------+---------------+-----------------+---------------+
| customer_id | customer_name | customer_street | customer_city |
+-------------+---------------+-----------------+---------------+
| C-101       | Jones         | Main            | Harrison      |
| C-201       | Smith         | North           | Rye           |
| C-211       | Hayes         | Main            | Harrison      |
| C-212       | Curry         | North           | Rye           |
| C-215       | Lindsay       | Park            | Pittsfield    |
| C-220       | Turner        | Putnam          | Stamford      |
| C-222       | Williams      | Nassau          | Princeton     |
| C-225       | Adams         | Spring          | Pittsfield    |
| C-226       | Johnson       | Alma            | Palo Alto     |
| C-233       | Glenn         | Sand Hill       | Woodside      |
| C-234       | Brooks        | Senator         | Brooklyn      |
| C-255       | Green         | Walnut          | Stamford      |
+-------------+---------------+-----------------+---------------+
12 rows in set (0.001 sec)

MariaDB [Bank]> create table branch (
    -> branch_name varchar(15),
    -> branch_city varchar(30),
    -> assets int, primary key (branch_name),
    -> check (assets >= 0));
Query OK, 0 rows affected (0.038 sec)

MariaDB [Bank]> insert into branch values ('Downtown', 'Brooklyn',9000000), ('Redwood', 'Palo Alto',2100000), ('Perryridge', 'Horseneck',1700000), ('Mianus', 'Horseneck',40
0000), ('Round Hill', 'Horseneck',8000000), ('Pownal', 'Bennington',300000), ('North Town', 'Rye',3700000), ('Brighton', 'Brooklyn',7100000);
Query OK, 8 rows affected (0.004 sec)
Records: 8  Duplicates: 0  Warnings: 0

MariaDB [Bank]> select * from branch;
+-------------+-------------+---------+
| branch_name | branch_city | assets  |
+-------------+-------------+---------+
| Brighton    | Brooklyn    | 7100000 |
| Downtown    | Brooklyn    | 9000000 |
| Mianus      | Horseneck   |  400000 |
| North Town  | Rye         | 3700000 |
| Perryridge  | Horseneck   | 1700000 |
| Pownal      | Bennington  |  300000 |
| Redwood     | Palo Alto   | 2100000 |
| Round Hill  | Horseneck   | 8000000 |
+-------------+-------------+---------+
8 rows in set (0.001 sec)

MariaDB [Bank]> create table account (
    -> branch_name varchar(15),
    -> account_number varchar(10) not null,
    -> balance int,
    -> primary key (account_number),
    -> check (balance >= 0));
Query OK, 0 rows affected (0.035 sec)

MariaDB [Bank]> insert into account values ('Downtown','A-101',500), ('Mianus','A-215',700) ,('Perryridge','A-102',400), ('Round Hill','A-305',350), ('Brighton','A-201',900
), ('Redwood','A-222',700), ('Brighton','A-217',750);
Query OK, 7 rows affected (0.022 sec)
Records: 7  Duplicates: 0  Warnings: 0

MariaDB [Bank]> select * from account;
+-------------+----------------+---------+
| branch_name | account_number | balance |
+-------------+----------------+---------+
| Downtown    | A-101          |     500 |
| Perryridge  | A-102          |     400 |
| Brighton    | A-201          |     900 |
| Mianus      | A-215          |     700 |
| Brighton    | A-217          |     750 |
| Redwood     | A-222          |     700 |
| Round Hill  | A-305          |     350 |
+-------------+----------------+---------+
7 rows in set (0.001 sec)
```

```
MariaDB [Bank]> create table loan (
    -> loan_number varchar(10) not null,
    -> branch_name varchar(15),
    -> amount int,
    -> primary key (loan_number));
Query OK, 0 rows affected (0.018 sec)

MariaDB [Bank]> insert into loan values ('L-17', 'Downtown', 1000),('L-23', 'Redwood', 2000), ('L-15', 'Perryridge', 1500), ('L-14', 'Downtown', 1500), ('L-93', 'Mianus', 5
00), ('L-11', 'Round Hill', 900), ('L-16', 'Perryridge', 1300);
Query OK, 7 rows affected (0.022 sec)
Records: 7  Duplicates: 0  Warnings: 0

MariaDB [Bank]> select * from loan;
+-------------+-------------+--------+
| loan_number | branch_name | amount |
+-------------+-------------+--------+
| L-11        | Round Hill  |    900 |
| L-14        | Downtown    |   1500 |
| L-15        | Perryridge  |   1500 |
| L-16        | Perryridge  |   1300 |
| L-17        | Downtown    |   1000 |
| L-23        | Redwood     |   2000 |
| L-93        | Mianus      |    500 |
+-------------+-------------+--------+
7 rows in set (0.001 sec)


MariaDB [Bank]> create table depositor (
    -> customer_id varchar(10) not null,
    -> account_number varchar(10) not null,
    -> primary key (customer_id,account_number),
    -> foreign key (customer_id) references customer(customer_id),
    -> foreign key (account_number) references account(account_number));
Query OK, 0 rows affected (0.607 sec)

MariaDB [Bank]> insert into depositor values ('C-226', 'A-101'), ('C-201', 'A-215'), ('C-211', 'A-102'), ('C-220', 'A-305'), ('C-226', 'A-201'), ('C-101', 'A-217'),('C-215'
, 'A-222');
Query OK, 7 rows affected (0.004 sec)
Records: 7  Duplicates: 0  Warnings: 0

MariaDB [Bank]> select * from depositor;
+-------------+----------------+
| customer_id | account_number |
+-------------+----------------+
| C-101       | A-217          |
| C-201       | A-215          |
| C-211       | A-102          |
| C-215       | A-222          |
| C-220       | A-305          |
| C-226       | A-101          |
| C-226       | A-201          |
+-------------+----------------+
7 rows in set (0.001 sec)


MariaDB [Bank]> create table borrower (
    -> customer_id varchar(10) not null,
    -> loan_number varchar(10) not null,
    -> primary key (customer_id, loan_number),
    -> foreign key (customer_id) references customer(customer_id),
    -> foreign key (loan_number) references loan(loan_number));
Query OK, 0 rows affected (0.059 sec)

MariaDB [Bank]> insert into borrower values ('C-101', 'L-17'), ('C-201', 'L-23'), ('C-211', 'L-15'), ('C-226', 'L-14'), ('C-212', 'L-93'), ('C-201', 'L-11'), ('C-222', 'L-1
7'), ('C-225', 'L-16');
Query OK, 8 rows affected (0.025 sec)
Records: 8  Duplicates: 0  Warnings: 0

MariaDB [Bank]> select * from borrower;
+-------------+-------------+
| customer_id | loan_number |
+-------------+-------------+
| C-101       | L-17        |
| C-201       | L-11        |
| C-201       | L-23        |
| C-211       | L-15        |
| C-212       | L-93        |
| C-222       | L-17        |
| C-225       | L-16        |
| C-226       | L-14        |
+-------------+-------------+
8 rows in set (0.001 sec)
```

Answer 1 :

Select customer.customer_name, loan.loan_number from customer inner join borrower on borrower.customer_id = customer.customer_id inner join loan on loan.loan_number = borrower.loan_number where loan.branch_name = 'Downtown';

```
MariaDB [Bank]> select customer.customer_name,loan.loan_number from customer
    -> inner join borrower on borrower.customer_id = customer.customer_id
    -> inner join loan on loan.loan_number = borrower.loan_number where
    -> loan.branch_name = 'Downtown';
+---------------+---------------+
| customer_name | loan_number   |
+---------------+---------------+
| Johnson       | L-14          |
| Jones         | L-17          |
| Williams      | L-17          |
+---------------+---------------+
3 rows in set (0.001 sec)
```

Answer 2 :

Select customer1.customer_name as Customer1, customer2.customer_name as Customer2, customer1.customer_city as City from customer customer1 inner join customer customer2 on customer1.customer_city = customer2.customer_city and customer1,customer_id != customer2.customer_id group by customer1.customer_city;

```
MariaDB [Bank]> select customer1.customer_name as Customer1, customer2.customer_name
    -> as Customer2, customer1.customer_city as City from customer customer1 inner
    -> join customer customer2 on customer1.customer_city = customer2.customer_city
    -> and customer1.customer_id != customer2.customer_id group by customer1.customer_city;
+-----------+-----------+------------+
| Customer1 | Customer2 | City       |
+-----------+-----------+------------+
| Hayes     | Jones     | Harrison   |
| Adams     | Lindsay   | Pittsfield |
| Curry     | Smith     | Rye        |
| Green     | Turner    | Stamford   |
+-----------+-----------+------------+
4 rows in set (0.001 sec)
```

Answer 3 :

Select branch_name. sum(balance*0.04) as total_interest from account group by branch_name;

```
MariaDB [Bank]> select branch_name, sum(balance*0.04) as total_interest from
    -> account group by branch_name;
+-------------+----------------+
| branch_name | total_interest |
+-------------+----------------+
| Brighton    |          66.00 |
| Downtown    |          20.00 |
| Mianus      |          28.00 |
| Perryridge  |          16.00 |
| Redwood     |          28.00 |
| Round Hill  |          14.00 |
+-------------+----------------+
6 rows in set (0.023 sec)
```

Answer 4 :

Select branch.branch_city, account.account_number, max(account.balance) as highest_balance from account inner join branch on account.branch_name = branch.branch_name group by branch.branch_city;

```
MariaDB [bank]> select branch.branch_city,account.account_number,
    -> max(account.balance) as highest_balance from account
    -> inner join branch on account.branch_name =
    -> branch.branch_name group by branch.branch_city;
+-------------+----------------+-----------------+
| branch_city | account_number | highest_balance |
+-------------+----------------+-----------------+
| Brooklyn    | A-101          |             900 |
| Horseneck   | A-102          |             700 |
| Palo Alto   | A-222          |             700 |
+-------------+----------------+-----------------+
3 rows in set (0.207 sec)
```

Answer 5 :

Select loan.loan_number, loan.amount, customer.customer_name from customer inner join borrower on customer.customer_id = borrower.customer_id inner join loan on loan.loan_number = borrower.loan_number order by loan.amount desc limit 5;

```
MariaDB [Bank]> select loan.loan_number, loan.amount, customer.customer_name from customer
    -> inner join borrower on customer.customer_id = borrower.customer_id inner join loan
    -> on loan.loan_number = borrower.loan_number order by loan.amount desc limit 5;
+-------------+--------+---------------+
| loan_number | amount | customer_name |
+-------------+--------+---------------+
| L-23        |   2000 | Smith         |
| L-14        |   1500 | Johnson       |
| L-15        |   1500 | Hayes         |
| L-16        |   1300 | Adams         |
| L-17        |   1000 | Jones         |
+-------------+--------+---------------+
5 rows in set (0.002 sec)
```

Answer 6 :

Select customer.customer_name from customer inner join depositor on customer.customer_id = depositor.customer_id inner join borrower on customer.customer_id = depositor,customer_id inner join account on account.account_number = depositor.account_number inner join loan on loan.loan_number = borrower.loan_number where account.branch_name = 'Perryridge' and loan.branch_name = 'Perryridge';

```
MariaDB [Bank]> select customer.customer_name from customer inner join depositor
    -> on customer.customer_id = depositor.customer_id inner join borrower on
    -> customer.customer_id = borrower.customer_id inner join account on
    -> account.account_number = depositor.account_number inner join loan on
    -> loan.loan_number = borrower.loan_number where account.branch_name =
    -> 'Perryridge' and loan.branch_name = 'Perryridge';
+---------------+
| customer_name |
+---------------+
| Hayes         |
+---------------+
1 row in set (0.001 sec)
```

Answer 7 :

Select customer.customer_name, sum(loan.amount) as total_loan from customer inner join borrower on customer.customer_id = borrower.customer_id inner join loan on borrower.loan_number = loan.loan_number group by customer.customer_id having count(customer.customer_id) >= 2;

```
MariaDB [bank]> select customer.customer_name,sum(loan.amount) as total_loan
    -> from customer inner join borrower on customer.customer_id =
    -> borrower.customer_id inner join loan on borrower.loan_number =
    -> loan.loan_number group by customer.customer_id having
    -> count(customer.customer_id) >= 2;
+---------------+------------+
| customer_name | total_loan |
+---------------+------------+
| Smith         |       2900 |
+---------------+------------+
1 row in set (0.055 sec)
```