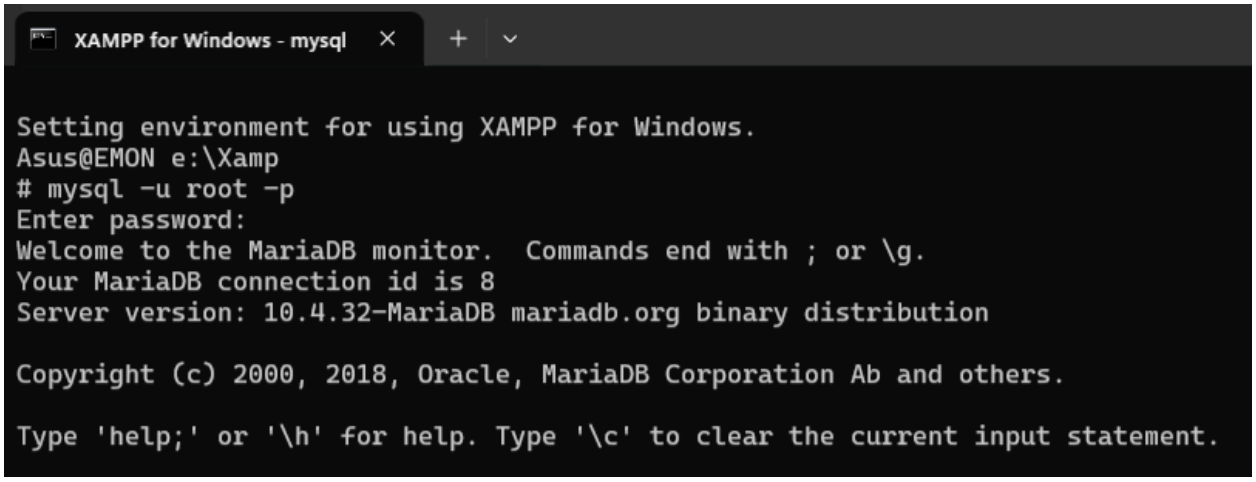
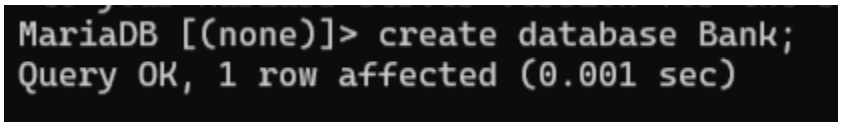
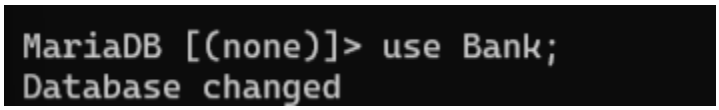
Lab Assignment 03:



Create database Bank;



Use Bank;



Insertions

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));

```
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 (0.014 sec)
```

create table branch (
branch_name varchar(15),
branch_city varchar(30),
assets int,
primary key (branch_name),
check (assets >= 0));

```
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 (0.015 sec)
```

create table account (
branch_name varchar(15),
account_number varchar(10) **not null**,
balance int,
primary key (account_number),
check (balance >= 0));

```
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 (0.012 sec)
```

create table loan (
loan_number varchar(10) **not null**,
branch_name varchar(15),
amount int,
primary key (loan_number));

```
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 (0.011 sec)
```

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));

```
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 (0.014 sec)
```

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));

```
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 (0.015 sec)
```

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', 'Stamford');

```
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', 'Stamford');
Query OK, 12 rows affected (0.012 sec)
Records: 12  Duplicates: 0  Warnings: 0
```

insert into branch values
('Downtown', 'Brooklyn',9000000),
('Redwood', 'Palo Alto',2100000),
('Perryridge', 'Horseneck',1700000),
('Mianus', 'Horseneck',400000),
('Round Hill', 'Horseneck',8000000),
('Pownal', 'Bennington',300000),
('North Town', 'Rye',3700000),
('Brighton', 'Brooklyn',7100000);

```
MariaDB [Bank]> insert into branch values
    -> ('Downtown', 'Brooklyn',9000000),
    -> ('Redwood', 'Palo Alto',2100000),
    -> ('Perryridge', 'Horseneck',1700000),
    -> ('Mianus', 'Horseneck',400000),
    -> ('Round Hill', 'Horseneck',8000000),
    -> ('Pownal', 'Bennington',300000),
    -> ('North Town', 'Rye',3700000),
    -> ('Brighton', 'Brooklyn',7100000);
Query OK, 8 rows affected (0.012 sec)
Records: 8  Duplicates: 0  Warnings: 0
```

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);

```
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 (0.005 sec)
Records: 7  Duplicates: 0  Warnings: 0
```

insert into loan values
('L-17', 'Downtown', 1000),
('L-23', 'Redwood', 2000),
('L-15', 'Perryridge', 1500),
('L-14', 'Downtown', 1500),
('L-93', 'Mianus', 500),
('L-11', 'Round Hill', 900),

('L-16', 'Perryridge', 1300);

```
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', 500),
    -> ('L-11', 'Round Hill', 900),
    -> ('L-16', 'Perryridge', 1300);
Query OK, 7 rows affected (0.004 sec)
Records: 7  Duplicates: 0  Warnings: 0
```

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');

```
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 (0.003 sec)
Records: 7  Duplicates: 0  Warnings: 0
```

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-17'),
('C-225', 'L-16');

```
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-17'),
    -> ('C-225', 'L-16');
Query OK, 8 rows affected (0.004 sec)
Records: 8  Duplicates: 0  Warnings: 0
```

1. ***Find the name and loan number of all customers having a loan at the Downtown branch.***

   select c.customer_name, b.loan_number from customer c

   join borrower b on c.customer_id = b.customer_id

   join loan l on b.loan_number = l.loan_number where l.branch_name = ‘downtown’;

```
MariaDB [Bank]> Select c.customer_name, b.loan_number from customer c
    -> Join borrower b on c.customer_id = b.customer_id
    -> Join loan l on b.loan_number = l.loan_number
    -> where l.branch_name = 'Downtown';
+---------------+-------------+
| customer_name | loan_number |
+---------------+-------------+
| Johnson       | L-14        |
| Jones         | L-17        |
| Williams      | L-17        |
+---------------+-------------+
3 rows in set (0.019 sec)
```

2. Find all the possible pairs of customers who are from the same city. show in the format Customer1, Customer2, City.

```
Select c1.customer_name as Customer1,
c2.customer_name as Customer2,
c1.customer_city as City
from customer c1
Join customer c2 on c1.customer_city = c2.customer_city
Where c1.customer_id < c2.customer_id;
```

```
MariaDB [Bank]> Select c1.customer_name as Customer1,
    -> c2.customer_name as Customer2,
    -> c1.customer_city as City
    -> from customer c1
    -> Join customer c2 on c1.customer_city = c2.customer_city
    -> Where c1.customer_id < c2.customer_id;
+-----------+-----------+------------+
| Customer1 | Customer2 | City       |
+-----------+-----------+------------+
| Jones     | Hayes     | Harrison   |
| Smith     | Curry     | Rye        |
| Lindsay   | Adams     | Pittsfield |
| Turner    | Green     | Stamford   |
+-----------+-----------+------------+
4 rows in set (0.003 sec)
```

3. If the bank gives out 4% interest to all accounts, show the total interest across each branch. Print Branch_name, Total_Interest.

```
Select ac.branch_name as Branch_name,
sum(4/100 * ac.balance) as Total_interest from account ac
Group by ac.branch_name;
```

```
MariaDB [Bank]> Select ac.branch_name as Branch_name,
    -> sum(4/100 * ac.balance) as Total_interest from account ac
    -> Group by ac.branch_name;
+-------------+----------------+
| Branch_name | Total_interest |
+-------------+----------------+
| Brighton    |        66.0000 |
| Downtown    |        20.0000 |
| Mianus      |        28.0000 |
| Perryridge  |        16.0000 |
| Redwood     |        28.0000 |
| Round Hill  |        14.0000 |
+-------------+----------------+
6 rows in set (0.013 sec)
```

4. Find account numbers with the highest balances for each city in the database

Select a.account_number, b.branch_city, a.balance from account a

Join branch b on a.branch_name = b.branch_name

Where (b.branch_city, a.balance) in (select b.branch_city, max(a.balance) as highest from account a join branch b on a.branch_name = b.branch_name group by b.branch_city);

```
MariaDB [Bank]> Select a.account_number, b.branch_city, a.balance from account a
    -> Join branch b on a.branch_name = b.branch_name
    -> Where (b.branch_city, a.balance) in (select b.branch_city, max(a.balance) as highest
 from account a join branch b on a.branch_name = b.branch_name group by b.branch_city);
+----------------+-------------+---------+
| account_number | branch_city | balance |
+----------------+-------------+---------+
| A-201          | Brooklyn    |     900 |
| A-215          | Horseneck   |     700 |
| A-222          | Palo Alto   |     700 |
+----------------+-------------+---------+
3 rows in set (0.001 sec)
```

5. Show the loan number, loan amount, and name of customers with the top 5 highest loan amounts. The data should be sorted by increasing amounts, then decreasing loan numbers in case of the same loan amount. [Hint for top 5: Check the "limit" keyword in mysql].

```
select l.loan_number, l.amount, c.customer_name from loan l
join borrower b on l.loan_number = b.loan_number
join customer c on b.customer_id = c.customer_id
Order by l.amount, l.loan_number DESC
limit 5;
```

```
MariaDB [Bank]> select l.loan_number, l.amount, c.customer_name from loan l
    -> join borrower b on l.loan_number = b.loan_number
    -> join customer c on b.customer_id = c.customer_id
    -> Order by l.amount, l.loan_number DESC
    -> limit 5;
+-------------+--------+---------------+
| loan_number | amount | customer_name |
+-------------+--------+---------------+
| L-93        |    500 | Curry         |
| L-11        |    900 | Smith         |
| L-17        |   1000 | Jones         |
| L-17        |   1000 | Williams      |
| L-16        |   1300 | Adams         |
+-------------+--------+---------------+
5 rows in set (0.003 sec)
```

6. Find the names of customers with an account and also a loan at the Perryridge branch.

```
select c.customer_name from customer c where exists
(select 1 from depositor d where d.customer_id = c.customer_id)
```

and exists (select 1 from borrower b join loan l on b.loan_number = l.loan_number

where l.branch_name = 'perryridge' and b.customer_id = c.customer_id);

```
MariaDB [Bank]> select c.customer_name from customer c where exists
    -> (select 1 from depositor d where d.customer_id = c.customer_id)
    -> and exists (select 1 from borrower b join loan l on b.loan_number = l.loan_number
    -> where l.branch_name = 'perryridge' and b.customer_id = c.customer_id);
+---------------+
| customer_name |
+---------------+
| Hayes         |
+---------------+
1 row in set (0.005 sec)
```

7. Find the total loan amount of all customers having at least 2 loans from the bank. Show in format customer name, total_loan.

select c.customer_name, sum(l.amount) as total_loan from customer c

join borrower b on c.customer_id = b.customer_id

join loan l on b.loan_number = l.loan_number

group by c.customer_id, c.customer_name

having count(b.loan_number) >= 2;

```
MariaDB [Bank]> select c.customer_name, sum(l.amount) as total_loan from customer c
    -> join borrower b on c.customer_id = b.customer_id
    -> join loan l on b.loan_number = l.loan_number
    -> group by c.customer_id, c.customer_name
    -> having count(b.loan_number) >= 2;
+---------------+------------+
| customer_name | total_loan |
+---------------+------------+
| Smith         |       2900 |
+---------------+------------+
1 row in set (0.004 sec)
```