

### Table creation

```
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)  
);  
  
CREATE TABLE branch (  
    branch_name VARCHAR(15),  
    branch_city VARCHAR(30),  
    assets INT,  
    PRIMARY KEY (branch_name),  
    CHECK (assets >= 0)  
);  
  
CREATE TABLE account (  
    branch_name VARCHAR(15),  
    account_number VARCHAR(10) NOT NULL,  
    balance INT,  
    PRIMARY KEY (account_number),  
    CHECK (balance >= 0)  
);  
  
CREATE TABLE loan (  
    loan_number VARCHAR(10) NOT NULL,  
    branch_name VARCHAR(15),  
    amount INT,  
    PRIMARY KEY (loan_number)  
);  
  
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)  
);  
  
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)  
);
```

**Adding records:**

```
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');
```

```
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);
```

```
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);
```

```
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);
```

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');
```

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 [assignment4]> 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 [assignment4]> 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 (0.000 sec)
```

```
MariaDB [assignment4]> 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 (0.000 sec)
```

```
MariaDB [assignment4]> 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 (0.000 sec)
```

```
MariaDB [assignment4]> 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 (0.000 sec)
```

```
MariaDB [assignment4]> 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 (0.000 sec)
```

1.

```
-- 1
SELECT customer.customer_name, loan.loan_number
FROM customer
INNER JOIN borrower
ON customer.customer_id = borrower.customer_id
INNER JOIN loan
ON borrower.loan_number = loan.loan_number
WHERE loan.branch_name = "Downtown";
```

```
MariaDB [assignment4]> -- 1
MariaDB [assignment4]> SELECT customer.customer_name, loan.loan_number
-> FROM customer
-> INNER JOIN borrower
-> ON customer.customer_id = borrower.customer_id
-> INNER JOIN loan
-> ON borrower.loan_number = loan.loan_number
-> WHERE loan.branch_name = "Downtown";
+-----+-----+
| customer_name | loan_number |
+-----+-----+
| Johnson       | L-14        |
| Jones         | L-17        |
| Williams      | L-17        |
+-----+-----+
3 rows in set (0.005 sec)
```

## 2.

```
-- 2
SELECT customer1.customer_name AS Customer1, customer2.customer_name AS
Customer2, customer1.customer_city AS City
FROM customer AS customer1
JOIN customer AS customer2
ON customer1.customer_city = customer2.customer_city
WHERE customer1.customer_id < customer2.customer_id;
```

```
MariaDB [assignment4]> -- 2
MariaDB [assignment4]> SELECT customer1.customer_name AS Customer1, customer2.customer_name AS Customer2, customer1.customer_city AS City
-> FROM customer AS customer1
-> JOIN customer AS customer2
-> ON customer1.customer_city = customer2.customer_city
-> WHERE customer1.customer_id < customer2.customer_id;
+-----+-----+-----+
| Customer1 | Customer2 | City |
+-----+-----+-----+
| Jones     | Hayes     | Harrison |
| Smith     | Curry     | Rye      |
| Lindsay   | Adams     | Pittsfield |
| Turner    | Green     | Stamford |
+-----+-----+-----+
4 rows in set (0.001 sec)
```

3.

```
-- 3
SELECT branch.branch_name, (IFNULL(SUM(account.balance), 0) * 4 / 100) AS
total_interest
FROM branch
LEFT JOIN account
ON branch.branch_name = account.branch_name
GROUP BY branch.branch_name
ORDER BY branch_name;
```

```
MariaDB [assignment4]> -- 3
MariaDB [assignment4]> SELECT branch.branch_name, (IFNULL(SUM(account.balance), 0) * 4 / 100) AS total_interest
-> FROM branch
-> LEFT JOIN account
-> ON branch.branch_name = account.branch_name
-> GROUP BY branch.branch_name
-> ORDER BY branch_name;
+-----+-----+
| branch_name | total_interest |
+-----+-----+
| Brighton    | 66.0000        |
| Downtown    | 20.0000        |
| Mianus       | 28.0000        |
| North Town   | 0.0000         |
| Perryridge   | 16.0000        |
| Pownal       | 0.0000         |
| Redwood      | 28.0000        |
| Round Hill   | 14.0000        |
+-----+-----+
8 rows in set (0.001 sec)
```

4.

```
-- 4
SELECT T1.branch_city, T1.account_number, T1.balance
FROM (
    SELECT branch.branch_city, account.account_number, account.balance
    FROM branch
    LEFT JOIN account
    ON branch.branch_name = account.branch_name
) AS T1
WHERE (T1.branch_city, T1.balance) IN (
    SELECT T2.branch_city, MAX(T2.balance)
    FROM (
        SELECT branch.branch_city, account.account_number, account.balance
        FROM branch
        LEFT JOIN account
        ON branch.branch_name = account.branch_name
    ) AS T2
    GROUP BY T2.branch_city
) ;
```

```
MariaDB [assignment4]> -- 4
MariaDB [assignment4]> SELECT T1.branch_city, T1.account_number, T1.balance
-> FROM (
->     SELECT branch.branch_city, account.account_number, account.balance
->     FROM branch
->     LEFT JOIN account
->     ON branch.branch_name = account.branch_name
-> ) AS T1
-> WHERE (T1.branch_city, T1.balance) IN (
->     SELECT T2.branch_city, MAX(T2.balance)
->     FROM (
->         SELECT branch.branch_city, account.account_number, account.balance
->         FROM branch
->         LEFT JOIN account
->         ON branch.branch_name = account.branch_name
->     ) AS T2
->     GROUP BY T2.branch_city
-> ) ;

+-----+-----+-----+
| branch_city | account_number | balance |
+-----+-----+-----+
| Brooklyn   | A-201          | 900     |
| Horseneck  | A-215          | 700     |
| Palo Alto  | A-222          | 700     |
+-----+-----+-----+
3 rows in set (0.001 sec)
```





5.

```
-- 5
SELECT loan_top.loan_number, loan_top.amount, customer.customer_name
FROM (
    SELECT *
    FROM loan
    ORDER BY amount DESC
    LIMIT 5
) AS loan_top
INNER JOIN borrower
ON loan_top.loan_number = borrower.loan_number
INNER JOIN customer
ON borrower.customer_id = customer.customer_id
ORDER BY loan_top.amount ASC, loan_top.loan_number DESC;
```

```
MariaDB [assignment4]> -- 5
MariaDB [assignment4]> SELECT loan_top.loan_number, loan_top.amount, customer.customer_name
-> FROM (
->     SELECT *
->     FROM loan
->     ORDER BY amount DESC
->     LIMIT 5
-> ) AS loan_top
-> INNER JOIN borrower
-> ON loan_top.loan_number = borrower.loan_number
-> INNER JOIN customer
-> ON borrower.customer_id = customer.customer_id
-> ORDER BY loan_top.amount ASC, loan_top.loan_number DESC;
+-----+-----+-----+
| loan_number | amount | customer_name |
+-----+-----+-----+
| L-17       | 1000   | Jones         |
| L-17       | 1000   | Williams      |
| L-16       | 1300   | Adams         |
| L-15       | 1500   | Hayes         |
| L-14       | 1500   | Johnson       |
| L-23       | 2000   | Smith         |
+-----+-----+-----+
6 rows in set (0.001 sec)
```

6.

```
-- 6
SELECT customer.customer_name
FROM customer
INNER JOIN depositor
ON customer.customer_id = depositor.customer_id
INNER JOIN account
ON depositor.account_number = account.account_number
INNER JOIN borrower
ON customer.customer_id = borrower.customer_id
INNER JOIN loan
ON borrower.loan_number = loan.loan_number
WHERE account.branch_name = "Perryridge" AND loan.branch_name = "Perryridge";
```

```
MariaDB [assignment4]> -- 6
MariaDB [assignment4]> SELECT customer.customer_name
-> FROM customer
-> INNER JOIN depositor
-> ON customer.customer_id = depositor.customer_id
-> INNER JOIN account
-> ON depositor.account_number = account.account_number
-> INNER JOIN borrower
-> ON customer.customer_id = borrower.customer_id
-> INNER JOIN loan
-> ON borrower.loan_number = loan.loan_number
-> WHERE account.branch_name = "Perryridge" AND loan.branch_name = "Perryridge";
+-----+
| customer_name |
+-----+
| Hayes         |
+-----+
1 row in set (0.001 sec)
```

Z.

```
-- 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_name
HAVING COUNT(loan.loan_number) >= 2;
```

```
MariaDB [assignment4]> -- 7
MariaDB [assignment4]> 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_name
-> HAVING COUNT(loan.loan_number) >= 2;
+-----+-----+
| customer_name | total_loan |
+-----+-----+
| Smith        |          2900 |
+-----+-----+
1 row in set (0.001 sec)
```