Assignment-3
Banking System

Tasks 1: Database Design:

1.

```
--TASK-1

CREATE DATABASE HMBank;
USE HMBank;
```

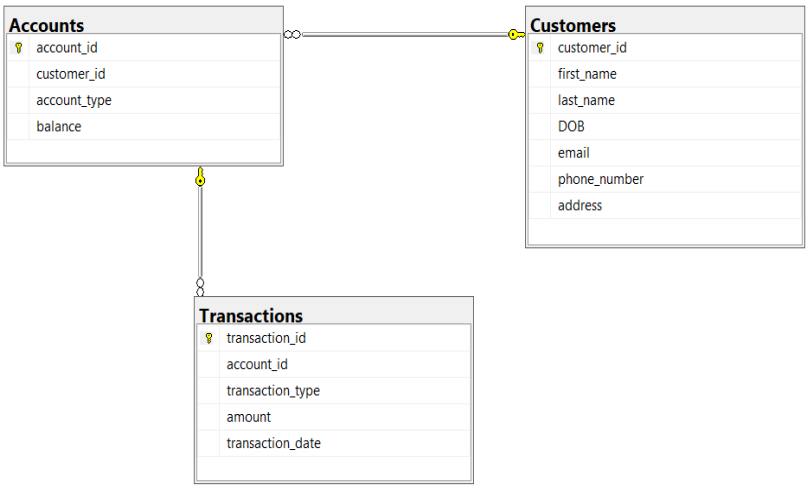
100 %

Messages

```
Commands completed successfully.

Completion time: 2023-12-10T18:33:50.3264219+05:30
```

2.



4.

```sql
CREATE TABLE Customers (
    customer_id INT PRIMARY KEY,
    first_name VARCHAR(50),
    last_name VARCHAR(50),
    DOB DATE,
    email VARCHAR(100),
    phone_number VARCHAR(15),
    address VARCHAR(255)
);

CREATE TABLE Accounts (
    account_id INT PRIMARY KEY,
    customer_id INT,
    account_type VARCHAR(20),
    balance DECIMAL(10, 2),
    FOREIGN KEY (customer_id) REFERENCES Customers(customer_id) ON DELETE SET NULL
);

CREATE TABLE Transactions (
    transaction_id INT PRIMARY KEY,
    account_id INT,
    transaction_type VARCHAR(20),
    amount DECIMAL(10, 2),
    transaction_date DATE,
    FOREIGN KEY (account_id) REFERENCES Accounts(account_id) ON DELETE SET NULL
);
```

100 %

Messages

```
Commands completed successfully.

Completion time: 2023-12-10T18:35:38.4696373+05:30
```

100 %

Query executed successfully.

Tasks 2: Select, Where, Between, AND, LIKE:

1.

```
INSERT INTO Customers VALUES
(1, 'Rahul', 'Sharma', '1990-05-15', 'rahul.sharma@email.com', '9876543210', 'Delhi'),
(2, 'Priya', 'Patel', '1985-08-22', 'priya.patel@email.com', '8765432109', 'Mumbai'),
(3, 'Amit', 'Singh', '1988-04-12', 'amit.singh@email.com', '7654321098', 'Kolkata'),
(4, 'Deepa', 'Shah', '1995-09-28', 'deepa.shah@email.com', '6543210987', 'Chennai'),
(5, 'Rajesh', 'Kumar', '1977-12-05', 'rajesh.kumar@email.com', '5432109876', 'Hyderabad'),
(6, 'Anita', 'Gupta', '1982-03-20', 'anita.gupta@email.com', '4321098765', 'Bangalore'),
(7, 'Suresh', 'Verma', '1992-06-18', 'suresh.verma@email.com', '3210987654', 'Mumbai'),
(8, 'Preeti', 'Agarwal', '1980-11-15', 'preeti.agarwal@email.com', '2109876543', 'Delhi'),
(9, 'Vikram', 'Rajput', '1993-02-25', 'vikram.rajput@email.com', '1098765432', 'Chandigarh'),
(10, 'Neha', 'Sharma', '1986-07-30', 'neha.sharma@email.com', '9876543210', 'Jaipur');
```

100 %

Messages

```
(10 rows affected)

Completion time: 2023-12-11T00:17:47.9229457+05:30
```

```
INSERT INTO Transactions VALUES
(1001, 101, 'deposit', 2000.00, '2023-01-10'),
(1002, 101, 'withdrawal', 1000.00, '2023-02-15'),
(1003, 107, 'deposit', 3000.00, '2023-03-20'),
(1004, 102, 'withdrawal', 1500.00, '2023-04-25'),
(1005, 104, 'deposit', 2500.00, '2023-05-10'),
(1006, 103, 'withdrawal', 1200.00, '2023-06-15'),
(1007, 104, 'deposit', 4000.00, '2023-07-05'),
(1008, 109, 'withdrawal', 2000.00, '2023-08-18'),
(1009, 105, 'deposit', 3500.00, '2023-09-22'),
(1010, 105, 'withdrawal', 1800.00, '2023-10-30');
```

100 %

Messages

```
(10 rows affected)

Completion time: 2023-12-11T00:18:31.0559256+05:30
```

```sql
INSERT INTO Accounts VALUES
(101, 1, 'savings', 5000.00),
(102, 10, 'zero_balance', 10000.00),
(103, 2, 'savings', 8000.00),
(104, 3, 'current', 12000.00),
(105, 4, 'savings', 6000.00),
(106, 5, 'zero_balance', 15000.00),
(107, 6, 'savings', 7000.00),
(108, 7, 'current', 18000.00),
(109, 8, 'zero_balance', 9000.00),
(110, 9, 'current', 20000.00);
```

100 %

Messages

```
(10 rows affected)

Completion time: 2023-12-11T00:18:18.8559478+05:30
```

2.1

1.

```sql
SELECT * FROM Customers WHERE address != 'Delhi';
```

100 %

Results Messages

	customer_id	first_name	last_name	DOB	email	phone_number	address
1	2	Priya	Patel	1985-08-22	priya.patel@email.com	8765432109	Mumbai
2	3	Amit	Singh	1988-04-12	amit.singh@email.com	7654321098	Kolkata
3	4	Deepa	Shah	1995-09-28	deepa.shah@email.com	6543210987	Chennai
4	5	Rajesh	Kumar	1977-12-05	rajesh.kumar@email.com	5432109876	Hyderabad
5	6	Anita	Gupta	1982-03-20	anita.gupta@email.com	4321098765	Bangalore
6	7	Suresh	Verma	1992-06-18	suresh.verma@email.com	3210987654	Mumbai
7	9	Vikram	Rajput	1993-02-25	vikram.rajput@email.com	1098765432	Chandigarh
8	10	Neha	Sharma	1986-07-30	neha.sharma@email.com	9876543210	Jaipur

2.

```
SELECT first_name, last_name, account_type, email FROM Customers, Accounts
WHERE Customers.customer_id = Accounts.customer_id;
```

100 %

Results | Messages

	first_name	last_name	account_type	email
1	Rahul	Sharma	savings	rahul.sharma@email.com
2	Neha	Sharma	zero_balance	neha.sharma@email.com
3	Priya	Patel	savings	priya.patel@email.com
4	Amit	Singh	current	amit.singh@email.com
5	Deepa	Shah	savings	deepa.shah@email.com
6	Rajesh	Kumar	zero_balance	rajesh.kumar@email.com
7	Anita	Gupta	savings	anita.gupta@email.com
8	Suresh	Verma	current	suresh.verma@email.com
9	Preeti	Agarwal	zero_balance	preeti.agarwal@email.com
10	Vikram	Rajput	current	vikram.rajput@email.com

3.

```
SELECT * FROM Transactions
JOIN Accounts ON Transactions.account_id = Accounts.account_id
JOIN Customers ON Accounts.customer_id = Customers.customer_id;
```

100 %

Results | Messages

	transaction_id	account_id	transaction_type	amount	transaction_date	account_id	customer_id	account_type	balance	customer_id	first_name	last_name	DOB	email	phone_number	address
1	1001	101	deposit	2000.00	2023-01-10	101	1	savings	5000.00	1	Rahul	Sharma	1990-05-15	rahul.sharma@email.com	9876543210	Delhi
2	1002	101	withdrawal	1000.00	2023-02-15	101	1	savings	5000.00	1	Rahul	Sharma	1990-05-15	rahul.sharma@email.com	9876543210	Delhi
3	1003	107	deposit	3000.00	2023-03-20	107	6	savings	7000.00	6	Anita	Gupta	1982-03-20	anita.gupta@email.com	4321098765	Bangalore
4	1004	102	withdrawal	1500.00	2023-04-25	102	10	zero_balance	10000.00	10	Neha	Sharma	1986-07-30	neha.sharma@email.com	9876543210	Jaipur
5	1005	104	deposit	2500.00	2023-05-10	104	3	current	12000.00	3	Amit	Singh	1988-04-12	amit.singh@email.com	7654321098	Kolkata
6	1006	103	withdrawal	1200.00	2023-06-15	103	2	savings	8000.00	2	Priya	Patel	1985-08-22	priya.patel@email.com	8765432109	Mumbai
7	1007	104	deposit	4000.00	2023-07-05	104	3	current	12000.00	3	Amit	Singh	1988-04-12	amit.singh@email.com	7654321098	Kolkata
8	1008	109	withdrawal	2000.00	2023-08-18	109	8	zero_balance	9000.00	8	Preeti	Agarwal	1980-11-15	preeti.agarwal@email.com	2109876543	Delhi
9	1009	105	deposit	3500.00	2023-09-22	105	4	savings	6000.00	4	Deepa	Shah	1995-09-28	deepa.shah@email.com	6543210987	Chennai
10	1010	105	withdrawal	1800.00	2023-10-30	105	4	savings	6000.00	4	Deepa	Shah	1995-09-28	deepa.shah@email.com	6543210987	Chennai

4.

```
UPDATE Accounts SET balance = balance + 700 WHERE account_id = 102;
```

100 %

Messages

```
(1 row affected)

Completion time: 2023-12-11T00:22:10.1226810+05:30
```

5.

```
SELECT CONCAT(first_name, ' ', last_name) AS full_name FROM Customers;
```

100 %

Results | Messages

	full_name
1	Rahul Sharma
2	Priya Patel
3	Amit Singh
4	Deepa Shah
5	Rajesh Kumar
6	Anita Gupta
7	Suresh Verma
8	Preeti Agarwal
9	Vikram Rajput
10	Neha Sharma

6.

```
DELETE FROM Accounts WHERE balance = 0 AND account_type = 'savings';
```

100 %

Messages

```
(0 rows affected)

Completion time: 2023-12-11T00:22:57.8903115+05:30
```

7.

```
SELECT * FROM Customers WHERE address = 'Mumbai';
```

100 %

Results | Messages

	customer_id	first_name	last_name	DOB	email	phone_number	address
1	2	Priya	Patel	1985-08-22	priya.patel@email.com	8765432109	Mumbai
2	7	Suresh	Verma	1992-06-18	suresh.verma@email.com	3210987654	Mumbai

8.

```
SELECT balance FROM Accounts WHERE account_id = 102;
```

100 %

Results | Messages

	balance
1	10700.00

9.

```
SELECT * FROM Accounts WHERE account_type = 'current' AND balance > 1000;
```

100 %

Results | Messages

	account_id	customer_id	account_type	balance
1	104	3	current	12000.00
2	108	7	current	18000.00
3	110	9	current	20000.00

10.

```
SELECT * FROM Transactions WHERE account_id = 101;
```

100 %

Results | Messages

	transaction_id	account_id	transaction_type	amount	transaction_date
1	1001	101	deposit	2000.00	2023-01-10
2	1002	101	withdrawal	1000.00	2023-02-15

11.

```
SELECT account_id, balance * 0.05 AS interest_accrued FROM Accounts WHERE account_type = 'savings';
```

100 %

Results | Messages

	account_id	interest_accrued
1	101	250.0000
2	103	400.0000
3	105	300.0000
4	107	350.0000

12.

```
SELECT * FROM Accounts WHERE balance < 500;
```

100 %

Results | Messages

	account_id	customer_id	account_type	balance
1	101	1	savings	499.00

Tasks 3: Aggregate functions, Having, Order By, GroupBy and Joins:

1.

```
SELECT AVG(balance) AS average_balance
FROM Accounts;
```

100 %

Results | Messages

	average_balance
1	10619.900000

2.

```
SELECT TOP 10 *
FROM accounts
ORDER BY balance DESC;
```

100 %

Results | Messages

	account_id	customer_id	account_type	balance
1	110	9	current	20000.00
2	108	7	current	18000.00
3	106	5	zero_balance	15000.00
4	104	3	current	12000.00
5	102	10	zero_balance	10700.00
6	109	8	zero_balance	9000.00
7	103	2	savings	8000.00
8	107	6	savings	7000.00
9	105	4	savings	6000.00
10	101	1	savings	499.00

3.

```sql
SELECT c.customer_id, c.first_name, SUM(t.amount) AS total_deposits
FROM customers c
JOIN accounts a ON c.customer_id = a.customer_id
JOIN transactions t ON a.account_id = t.account_id
WHERE t.transaction_type = 'deposit' AND CONVERT(DATE, t.transaction_date) = '2023-05-10'
GROUP BY c.customer_id, c.first_name;
```

100 %

Results | Messages

	customer_id	first_name	total_deposits
1	3	Amit	2500.00

4.

```sql
SELECT TOP 1 *FROM Customers
ORDER BY DOB ASC;
```

100 %

Results | Messages

	customer_id	first_name	last_name	DOB	email	phone_number	address
1	5	Rajesh	Kumar	1977-12-05	rajesh.kumar@email.com	5432109876	Hyderabad

```sql
SELECT TOP 1 *FROM Customers
ORDER BY DOB DESC;
```

100 %

Results | Messages

	customer_id	first_name	last_name	DOB	email	phone_number	address
1	4	Deepa	Shah	1995-09-28	deepa.shah@email.com	6543210987	Chennai

5.

```sql
SELECT
    t.transaction_id,
    t.transaction_date,
    t.amount,
    t.transaction_type,
    a.account_type
FROM transactions t
JOIN accounts a ON t.account_id = a.account_id;
```

100 %

Results | Messages

	transaction_id	transaction_date	amount	transaction_type	account_type
1	1001	2023-01-10	2000.00	deposit	savings
2	1002	2023-02-15	1000.00	withdrawal	savings
3	1003	2023-03-20	3000.00	deposit	savings
4	1004	2023-04-25	1500.00	withdrawal	zero_balance
5	1005	2023-05-10	2500.00	deposit	current
6	1006	2023-06-15	1200.00	withdrawal	savings
7	1007	2023-07-05	4000.00	deposit	current
8	1008	2023-08-18	2000.00	withdrawal	zero_balance
9	1009	2023-09-22	3500.00	deposit	savings
10	1010	2023-10-30	1800.00	withdrawal	savings

6.

```sql
SELECT
    c.customer_id,
    c.first_name,
    a.account_id,
    a.account_type,
    a.balance
FROM customers c
JOIN accounts a ON c.customer_id = a.customer_id;
```

100 %

Results | Messages

	customer_id	first_name	account_id	account_type	balance
1	1	Rahul	101	savings	499.00
2	10	Neha	102	zero_balance	10700.00
3	2	Priya	103	savings	8000.00
4	3	Amit	104	current	12000.00
5	4	Deepa	105	savings	6000.00
6	5	Rajesh	106	zero_balance	15000.00
7	6	Anita	107	savings	7000.00
8	7	Suresh	108	current	18000.00
9	8	Preeti	109	zero_balance	9000.00
10	9	Vikram	110	current	20000.00

7.

```sql
SELECT
    t.transaction_id,
    t.transaction_date,
    t.amount,
    t.transaction_type,
    c.customer_id,
    c.first_name,
    a.account_id,
    a.account_type,
    a.balance
FROM transactions t
JOIN accounts a ON t.account_id = a.account_id
JOIN customers c ON a.customer_id = c.customer_id
WHERE a.account_id = '104';
```

100 %

Results | Messages

	transaction_id	transaction_date	amount	transaction_type	customer_id	first_name	account_id	account_type	balance
1	1005	2023-05-10	2500.00	deposit	3	Amit	104	current	12000.00
2	1007	2023-07-05	4000.00	deposit	3	Amit	104	current	12000.00

8.

```sql
SELECT
    c.customer_id,
    c.first_name,
    COUNT(a.account_id) AS number_of_accounts
FROM customers c
JOIN accounts a ON c.customer_id = a.customer_id
GROUP BY c.customer_id, c.first_name
HAVING COUNT(a.account_id) > 1;
```

.00 %

Results | Messages

customer_id	first_name	number_of_accounts

9.

```sql
SELECT
    t.account_id,
    SUM(CASE WHEN t.transaction_type = 'Deposit' THEN t.amount ELSE -t.amount END) AS difference_amount
FROM transactions t
GROUP BY t.account_id;
```

100 %

Results | Messages

	account_id	difference_amount
1	101	1000.00
2	102	-1500.00
3	103	-1200.00
4	104	6500.00
5	105	1700.00
6	107	3000.00
7	109	-2000.00

10.

```sql
SELECT
    t.account_id,
    AVG(t.amount) AS average_daily_balance
FROM transactions t
WHERE t.transaction_date BETWEEN '2023-01-10' AND '2023-10-30'
GROUP BY t.account_id;
```

100 %

Results | Messages

	account_id	average_daily_balance
1	101	1500.000000
2	102	1500.000000
3	103	1200.000000
4	104	3250.000000
5	105	2650.000000
6	107	3000.000000
7	109	2000.000000

11.

```sql
SELECT
    a.account_type,
    SUM(t.amount) AS total_balance
FROM transactions t
JOIN accounts a ON t.account_id = a.account_id
GROUP BY a.account_type;
```

100 %

Results | Messages

	account_type	total_balance
1	current	6500.00
2	savings	12500.00
3	zero_balance	3500.00

12.

```sql
SELECT
    a.account_id,
    COUNT(t.transaction_id) AS transaction_count
FROM accounts a
JOIN transactions t ON a.account_id = t.account_id
GROUP BY a.account_id
ORDER BY transaction_count DESC;
```

100 %

Results | Messages

	account_id	transaction_count
1	104	2
2	105	2
3	101	2
4	102	1
5	103	1
6	107	1
7	109	1

13.

```sql
SELECT
    c.customer_id,
    c.first_name,
    a.account_type,
    SUM(t.amount) AS aggregate_balance
FROM customers c
JOIN accounts a ON c.customer_id = a.customer_id
JOIN transactions t ON a.account_id = t.account_id
GROUP BY c.customer_id, c.first_name, a.account_type
ORDER BY aggregate_balance DESC;
```

100 %

Results | Messages

	customer_id	first_name	account_type	aggregate_balance
1	3	Amit	current	6500.00
2	4	Deepa	savings	5300.00
3	6	Anita	savings	3000.00
4	1	Rahul	savings	3000.00
5	8	Preeti	zero_balance	2000.00
6	10	Neha	zero_balance	1500.00
7	2	Priya	savings	1200.00

14.

```sql
WITH DuplicateTransactions AS (
    SELECT amount, transaction_date, account_id, COUNT(*) AS num_duplicates
    FROM Transactions
    GROUP BY amount, transaction_date, account_id
    HAVING COUNT(*) > 1
)
SELECT *
FROM DuplicateTransactions;
```

100 %

Results | Messages

	amount	transaction_date	account_id	num_duplicates
1	2000.00	2023-01-10	101	2

Tasks 4: Subquery and its type:

1.

```
SELECT TOP 1 c.customer_id, c.first_name, c.last_name, MAX(a.balance) AS highest_balance
FROM Customers c
JOIN Accounts a ON c.customer_id = a.customer_id
GROUP BY c.customer_id, c.first_name, c.last_name
ORDER BY highest_balance DESC;
```

100 %

Results | Messages

	customer_id	first_name	last_name	highest_balance
1	9	Vikram	Rajput	20000.00

2.

```
SELECT sub.customer_id, AVG(sub.avg_balance) AS average_balance
FROM (
    SELECT c.customer_id, AVG(a.balance) AS avg_balance
    FROM Customers c
    JOIN Accounts a ON c.customer_id = a.customer_id
    GROUP BY c.customer_id
    HAVING COUNT(a.account_id) > 1
) AS sub GROUP BY sub.customer_id;
```

100 %

Results | Messages

	customer_id	average_balance
1	1	27749.500000

3.

```sql
SELECT a.*, t.*
FROM Accounts a
JOIN Transactions t ON a.account_id = t.account_id
WHERE t.amount > (SELECT AVG(amount) FROM Transactions);
```

100 %

Results | Messages

	account_id	customer_id	account_type	balance	transaction_id	account_id	transaction_type	amount	transaction_date
1	107	6	savings	7000.00	1003	107	deposit	3000.00	2023-03-20
2	104	3	current	12000.00	1005	104	deposit	2500.00	2023-05-10
3	104	3	current	12000.00	1007	104	deposit	4000.00	2023-07-05
4	105	4	savings	6000.00	1009	105	deposit	3500.00	2023-09-22

4.

```sql
SELECT
    c.customer_id,
    c.first_name
FROM customers c
LEFT JOIN Accounts a ON c.customer_id = a.customer_id
LEFT JOIN Transactions t ON a.account_id = t.account_id
WHERE t.transaction_id IS NULL;
```

100 %

Results | Messages

	customer_id	first_name
1	1	Rahul
2	5	Rajesh
3	7	Suresh
4	9	Vikram

5.

```
SELECT
    a.account_id,
    a.account_type,
    CASE WHEN SUM(a.balance) IS NULL THEN 0 ELSE SUM(a.balance) END AS total_balance
FROM Accounts a
LEFT JOIN transactions t ON a.account_id = t.account_id
WHERE t.transaction_id IS NULL
GROUP BY a.account_id, a.account_type;
```

100 %

Results | Messages

	account_id	account_type	total_balance
1	106	zero_balance	15000.00
2	108	current	18000.00
3	110	current	20000.00
4	111	current	55000.00

6.

```
SELECT *
FROM transactions
WHERE amount = (SELECT MIN(amount) FROM transactions);
```

100 %

Results | Messages

	transaction_id	account_id	transaction_type	amount	transaction_date
1	1002	101	withdrawal	1000.00	2023-02-15

7.

```sql
SELECT
    customer_id,
    first_name
FROM customers
WHERE customer_id IN (
    SELECT customer_id
    FROM accounts
    GROUP BY customer_id
    HAVING COUNT(DISTINCT account_type) > 1
);
```

100 %

Results | Messages

	customer_id	first_name
1	1	Rahul

8.

```sql
--8
SELECT account_type,
       COUNT(*) AS num_accounts,
       ROUND((COUNT(*) * 100.0 / (SELECT COUNT(*) FROM Accounts)), 2) AS percentage
FROM Accounts
GROUP BY account_type;
```

100 %

Results | Messages

	account_type	num_accounts	percentage
1	current	3	30.000000000000
2	savings	4	40.000000000000
3	zero_balance	3	30.000000000000

9.

```sql
--9
SELECT * FROM Transactions
WHERE account_id IN (SELECT account_id FROM Accounts
WHERE customer_id = 1
);
```

100 %

Results | Messages

	transaction_id	account_id	transaction_type	amount	transaction_date
1	1001	101	deposit	2000.00	2023-01-10
2	1002	101	withdrawal	1000.00	2023-02-15

10

```sql
--10
SELECT account_type,
       (SELECT SUM(balance) FROM Accounts A WHERE A.account_type = Accounts.account_type) AS total_balance
FROM Accounts
GROUP BY account_type;
```

100 %

Results | Messages

	account_type	total_balance
1	current	50000.00
2	savings	26000.00
3	zero_balance	34700.00