

HEXAWARE ASSIGNMENT 1

Banking System

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ASSIGNMENT: Banking System

Task 1

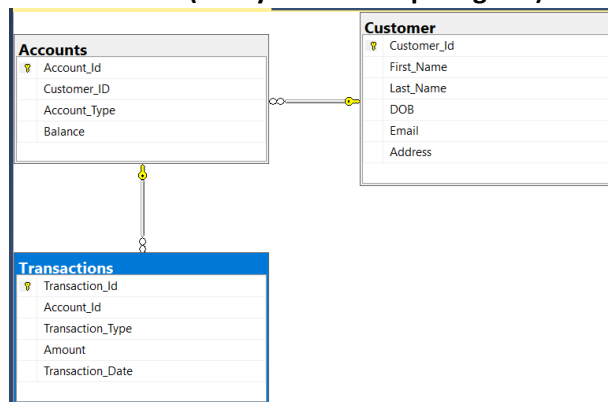
1. Create the database named "HMBank".

```
CREATE DATABASE HMBank;
```

2. Define the schema for the Customers, Accounts, and Transactions tables based on the provided schema.

```
CREATE TABLE HMBank.dbo.Customer (Customer_Id INT IDENTITY PRIMARY KEY, First_Name VARCHAR(65), Last_Name VARCHAR(65),  
DOB DATE, Email VARCHAR(65), Address VARCHAR(65))  
CREATE TABLE HMBank.dbo.Accounts (Account_Id INT IDENTITY PRIMARY KEY, Customer_ID INT FOREIGN KEY REFERENCES HMBank.dbo.Customer(Customer_Id));  
ALTER TABLE HMBank.dbo.Accounts ADD  
Account_Type VARCHAR(65), Balance INT;  
CREATE TABLE HMBank.dbo.Transactions (Transaction_Id INT IDENTITY PRIMARY KEY, Account_Id INT FOREIGN KEY REFERENCES HMBank.dbo.Accounts(Account_I  
Transaction_Type VARCHAR(65), Amount INT, Transaction_Date DATE);
```

3. Create an ERD (Entity Relationship Diagram) for the database.



4. Create appropriate Primary Key and Foreign Key constraints for referential integrity.
 5. Write SQL scripts to create the mentioned tables with appropriate data types, constraints, and relationships.
- Customers
 - Accounts
 - Transactions

Task 2

1. Insert at least 10 sample records into each of the following tables.

- Customers
- Accounts
- Transactions

-----Inserting Data-->

```
INSERT INTO HMBank.dbo.Customer (First_Name, Last_Name, DOB, Email, Address)  
VALUES  
( 'John', 'Doe', '1985-05-15', 'john.doe@example.com', '123 Elm Street'),  
( 'Jane', 'Smith', '1990-07-23', 'jane.smith@example.com', '456 Oak Avenue'),  
( 'Emily', 'Johnson', '1992-11-30', 'emily.johnson@example.com', '789 Pine Road'),  
( 'Michael', 'Brown', '1988-03-10', 'michael.brown@example.com', '101 Maple Boulevard'),  
( 'Emma', 'Jones', '1995-04-17', 'emma.jones@example.com', '202 Birch Lane'),  
( 'David', 'Miller', '1993-09-19', 'david.miller@example.com', '303 Cedar Drive'),  
( 'Sophia', 'Davis', '1987-08-22', 'sophia.davis@example.com', '404 Walnut Street'),  
( 'William', 'Garcia', '1991-12-01', 'william.garcia@example.com', '505 Spruce Way'),  
( 'Olivia', 'Martinez', '1994-02-14', 'olivia.martinez@example.com', '606 Redwood Place'),  
( 'James', 'Wilson', '1989-06-07', 'james.wilson@example.com', '707 Chestnut Street');
```

```
INSERT INTO HMBank.dbo.Transactions (Account_Id, Transaction_Type, Amount, Transaction_Date)  
VALUES  
(1, 'Deposit', 1000, '2024-01-01'),  
(2, 'Withdrawal', 2000, '2024-02-15'),  
(3, 'Deposit', 500, '2024-03-05'),  
(4, 'Withdrawal', 1000, '2024-04-22'),  
(5, 'Deposit', 700, '2024-05-30'),  
(6, 'Withdrawal', 1500, '2024-06-15'),  
(7, 'Deposit', 200, '2024-07-10'),
```

```
INSERT INTO HMBank.dbo.Accounts (Customer_ID, Account_Type, Balance)  
VALUES  
(1, 'Savings', 1500),  
(2, 'Checking', 5000),  
(3, 'Savings', 3000),  
(4, 'Checking', 2500),  
(5, 'Savings', 1000),  
(6, 'Checking', 4500),  
(7, 'Savings', 200),  
(8, 'Checking', 3200),  
(9, 'Savings', 500),  
(10, 'Checking', 800);
```

2. Write SQL queries for the following tasks:

1. Write a SQL query to retrieve the name, account type and email of all customers.

```
SELECT C.First_Name, C.Last_Name, C.Email, A.Account_Type
FROM HMBank.dbo.Customer C
JOIN HMBank.dbo.Accounts A ON C.Customer_Id = A.Customer_Id;
```

	First_Name	Last_Name	Email	Account_Type
1	John	Doe	john.doe@example.com	Savings
2	Jane	Smith	jane.smith@example.com	Checking
3	Emily	Johnson	emily.johnson@example.com	Savings
4	Michael	Brown	michael.brown@example.com	Checking
5	Emma	Jones	emma.jones@example.com	Savings
6	David	Miller	david.miller@example.com	Checking
7	William	Garcia	william.garcia@example.com	Checking
8	Olivia	Martinez	olivia.martinez@example.com	Savings
9	James	Wilson	james.wilson@example.com	Checking

2. Write a SQL query to list all transaction corresponding customer.

```
SELECT C.First_Name, C.Last_Name, T.Transaction_Id, T.Transaction_Type, T.Amount, T.Transaction
FROM HMBank.dbo.Customer C
JOIN HMBank.dbo.Accounts A ON C.Customer_Id = A.Customer_Id
JOIN HMBank.dbo.Transactions T ON A.Account_Id = T.Account_Id;
```

	First_Name	Last_Name	Transaction_Id	Transaction_Type	Amount	Transaction_Date
1	John	Doe	1	Deposit	1000	2024-01-01
2	Jane	Smith	2	Withdrawal	2000	2024-02-15
3	Emily	Johnson	3	Deposit	500	2024-03-05
4	Michael	Brown	4	Withdrawal	1000	2024-04-22
5	Emma	Jones	5	Deposit	700	2024-05-30
6	David	Miller	6	Withdrawal	1500	2024-06-15
7	William	Garcia	8	Deposit	1200	2024-08-20
8	Olivia	Martinez	9	Withdrawal	300	2024-09-05
9	James	Wilson	10	Deposit	800	2024-09-18

3. Write a SQL query to increase the balance of a specific account by a certain amount.

```
UPDATE HMBank.dbo.Accounts
SET Balance = Balance + 500
WHERE Account_Id = 1;
```

4. Write a SQL query to Combine first and last names of customers as a full_name.

```
SELECT CONCAT(First_Name, ' ', Last_Name) AS full_name
FROM HMBank.dbo.Customer;
```

	full_name
1	John Doe
2	Jane Smith
3	Emily Johnson
4	Michael Brown
5	Emma Jones
6	David Miller
7	Sophia Davis
8	William Garcia
9	Olivia Martinez
10	James Wilson

5. Write a SQL query to remove accounts with a balance of zero where the account type is savings.

```
DELETE FROM HMBank.dbo.Transactions
WHERE Account_Id IN (SELECT Account_Id FROM HMBank.dbo.Accounts WHERE Balance = 0 AND Account_Type = 'Savings');
```

	Account_Id	Customer_ID	Account_Type	Balance
1	1	1	Savings	3000
2	2	2	Checking	5000
3	3	3	Savings	3000
4	4	4	Checking	2500
5	6	6	Checking	0
6	8	8	Checking	3200
7	9	9	Savings	500
8	10	10	Checking	800

6. Write a SQL query to Find customers living in a specific city.

```
SELECT * FROM HMBank.dbo.Customer
WHERE Address LIKE '%Oak%';
```

	Customer_Id	First_Name	Last_Name	DOB	Email	Address
1	2	Jane	Smith	1990-07-23	jane.smith@example.com	456 Oak Avenue

7. Write a SQL query to Get the account balance for a specific account.

```
SELECT Balance
FROM HMBank.dbo.Accounts
WHERE Account_Id = 1;
```

	Balance
1	3000

8. Write a SQL query to List all current accounts with a balance greater than \$1,000.

```
SELECT * FROM HMBank.dbo.Accounts
WHERE Account_Type = 'Checking' AND Balance > 1000;
```

	Account_Id	Customer_ID	Account_Type	Balance
1	2	2	Checking	5000
2	4	4	Checking	2500
3	8	8	Checking	3200

9. Write a SQL query to Retrieve all transactions for a specific account.

```
SELECT * FROM HMBank.dbo.Transactions
WHERE Account_Id = 1;
```

	Transaction_Id	Account_Id	Transaction_Type	Amount	Transaction_Date
1	1	1	Deposit	1000	2024-01-01

10. Write a SQL query to Calculate the interest accrued on savings accounts based on a given interest rate.

```
SELECT Account_Id, Balance, (Balance * 0.03) AS Interest_Accrued
FROM HMBank.dbo.Accounts
WHERE Account_Type = 'Savings';
```

	Account_Id	Balance	Interest_Accrued
1	1	3000	90.00
2	3	3000	90.00
3	9	500	15.00

11. Write a SQL query to Identify accounts where the balance is less than a specified overdraft limit.

```
SELECT * FROM HMBank.dbo.Accounts
WHERE Balance < -500;
```

12. Write a SQL query to Find customers not living in a specific city.

```
SELECT * FROM HMBank.dbo.Customer
WHERE Address NOT LIKE '%oak%';
```

	Customer_Id	First_Name	Last_Name	DOB	Email	Address
1	1	John	Doe	1985-05-15	john.doe@example.com	123 Elm Street
2	3	Emily	Johnson	1992-11-30	emily.johnson@example.com	789 Pine Road
3	4	Michael	Brown	1988-03-10	michael.brown@example.com	101 Maple Boulevard
4	5	Emma	Jones	1995-04-17	emma.jones@example.com	202 Birch Lane
5	6	David	Miller	1993-09-19	david.miller@example.com	303 Cedar Drive
6	7	Sophia	Davis	1987-08-22	sophia.davis@example.com	404 Walnut Street
7	8	William	Garcia	1991-12-01	william.garcia@example.com	505 Spruce Way
8	9	Olivia	Martinez	1994-02-14	olivia.martinez@example.com	606 Redwood Place
9	10	James	Wilson	1989-06-07	james.wilson@example.com	707 Chestnut Street

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

1. Write a SQL query to Find the average account balance for all customers.

```
SELECT AVG(Balance) AS Avg_Balance
FROM HMBank.dbo.Accounts;
```

	Avg_Balance
1	2250

2. Write a SQL query to Retrieve the top 10 highest account balances.

```
SELECT TOP 10 *
FROM HMBank.dbo.Accounts
ORDER BY Balance DESC;
```

	Account_Id	Customer_ID	Account_Type	Balance
1	2	2	Checking	5000
2	8	8	Checking	3200
3	1	1	Savings	3000
4	3	3	Savings	3000
5	4	4	Checking	2500
6	10	10	Checking	800
7	9	9	Savings	500
8	6	6	Checking	0

3. Write a SQL query to Calculate Total Deposits for All Customers in specific date.

```
SELECT SUM(Amount) AS Total_Deposits
FROM HMBank.dbo.Transactions
WHERE Transaction_Type = 'Deposit' AND Transaction Date = '2024-03-05';
```

	Total_Deposits
1	500

4. Write a SQL query to Find the Oldest and Newest Customers.

```
-- Oldest customer
SELECT TOP 1 *
FROM HMBank.dbo.Customer
ORDER BY DOB ASC;

-- Newest customer
SELECT TOP 1 *
FROM HMBank.dbo.Customer
ORDER BY DOB DESC;
```

Customer_Id	First_Name	Last_Name	DOB	Email	Address
1	John	Doe	1985-05-15	john.doe@example.com	123 Elm Street

Customer_Id	First_Name	Last_Name	DOB	Email	Address
5	Emma	Jones	1995-04-19	emma.jones@example.com	202 Birch Lane

5. Write a SQL query to Retrieve transaction details along with the account type.

```
SELECT T.Transaction_Id, T.Transaction_Type, T.Amount, A.Account_Type
FROM HMBank.dbo.Transactions T
JOIN HMBank.dbo.Accounts A ON T.Account_Id = A.Account_Id;
```

	Transaction_Id	Transaction_Type	Amount	Account_Type
1	1	Deposit	1000	Savings
2	2	Withdrawal	2000	Checking
3	3	Deposit	500	Savings
4	4	Withdrawal	1000	Checking
5	6	Withdrawal	1500	Checking
6	8	Deposit	1200	Checking
7	9	Withdrawal	300	Savings
8	10	Deposit	800	Checking

6. Write a SQL query to Get a list of customers along with their account details.

```
SELECT C.First Name, C.Last Name, A.Account Id, A.Account Type, A.Balance
FROM HMBank.dbo.Customer C
JOIN HMBank.dbo.Accounts A ON C.Customer Id = A.Customer ID;
```

	First Name	Last Name	Account Id	Account Type	Balance
1	John	Doe	1	Savings	3000
2	Jane	Smith	2	Checking	5000
3	Emily	Johnson	3	Savings	3000
4	Michael	Brown	4	Checking	2500
5	David	Miller	6	Checking	0
6	William	Garcia	8	Checking	3200
7	Olivia	Martinez	9	Savings	500
8	James	Wilson	10	Checking	800

7. Write a SQL query to Retrieve transaction details along with customer information for a specific account.

```
SELECT C.First Name, C.Last Name, T.Transaction Id, T.Transaction Type, T.Amount, T.Transaction Date
FROM HMBank.dbo.Customer C
JOIN HMBank.dbo.Accounts A ON C.Customer Id = A.Customer ID
JOIN HMBank.dbo.Transactions T ON A.Account Id = T.Account Id
WHERE A.Account Id = 1;
```

	First Name	Last Name	Transaction Id	Transaction Type	Amount	Transaction Date
1	John	Doe	1	Deposit	1000	2024-01-01

8. Write a SQL query to Identify customers who have more than one account.

```
SELECT C.First Name, C.Last Name, COUNT(A.Account Id) AS Account_Count
FROM HMBank.dbo.Customer C
JOIN HMBank.dbo.Accounts A ON C.Customer Id = A.Customer ID
GROUP BY C.First Name, C.Last Name
HAVING COUNT(A.Account Id) > 1;
```

9. Write a SQL query to Calculate the difference in transaction amounts between deposits and withdrawals.

```
SELECT Account Id,
SUM(CASE WHEN Transaction Type = 'Deposit' THEN Amount ELSE 0 END) -
SUM(CASE WHEN Transaction Type = 'Withdrawal' THEN Amount ELSE 0 END) AS Transaction_Difference
FROM HMBank.dbo.Transactions
GROUP BY Account Id;
```

	Account Id	Transaction_Difference
1	1	1000
2	2	-2000
3	3	500
4	4	-1000
5	6	-1500
6	8	1200
7	9	-300
8	10	800

10. Write a SQL query to Calculate the average daily balance for each account over a specified period.

```
-- Calculate the average daily balance for each account over a specified period
SELECT A.Account Id,
AVG(Total_Daily_Amount) AS Avg_Daily_Balance
FROM (
-- Subquery to calculate the total amount for each account per day
SELECT T.Account Id, T.Transaction Date, SUM(T.Amount) AS Total_Daily_Amount
FROM HMBank.dbo.Transactions T
WHERE T.Transaction Date BETWEEN '2024-01-01' AND '2024-12-31'
GROUP BY T.Account Id, T.Transaction Date
) AS DailyTotals
JOIN HMBank.dbo.Accounts A ON A.Account Id = DailyTotals.Account Id
GROUP BY A.Account Id;
```

	Account Id	Avg_Daily_Balance
1	1	1000
2	2	2000
3	3	500
4	4	1000
5	6	1500
6	8	1200
7	9	300
8	10	800

11. Calculate the total balance for each account type.

```
SELECT Account_Type, SUM(Balance) AS Total_Balance
FROM HMBank.dbo.Accounts
GROUP BY Account_Type;
```

	Account_Type	Total_Balance
1	Checking	11500
2	Savings	6500

12. Identify accounts with the highest number of transactions order by descending order.

```
SELECT A.Account_Id, COUNT(T.Transaction_Id) AS Transaction_Count
FROM HMBank.dbo.Accounts A
JOIN HMBank.dbo.Transactions T ON A.Account_Id = T.Account_Id
GROUP BY A.Account_Id
ORDER BY Transaction_Count DESC;
```

	Account_Id	Transaction_Count
1	1	1
2	2	1
3	3	1
4	4	1
5	6	1
6	8	1
7	9	1
8	10	1

13. List customers with high aggregate account balances, along with their account types.

```
SELECT C.First_Name, C.Last_Name, A.Account_Type, SUM(A.Balance) AS Total_Balance
FROM HMBank.dbo.Customer C
JOIN HMBank.dbo.Accounts A ON C.Customer_Id = A.Customer_Id
GROUP BY C.First_Name, C.Last_Name, A.Account_Type
HAVING SUM(A.Balance) >= 5000;
```

	First_Name	Last_Name	Account_Type	Total_Balance
1	Jane	Smith	Checking	5000

14. Identify and list duplicate transactions based on transaction amount, date, and account.

```
SELECT Account_Id, Amount, Transaction_Date, COUNT(*) AS Duplicate_Count
FROM HMBank.dbo.Transactions
GROUP BY Account_Id, Amount, Transaction_Date
HAVING COUNT(*) > 1;
```

Account_Id	Amount	Transaction_Date	Duplicate_Count
------------	--------	------------------	-----------------

Tasks 4: Subquery and its type:

1. Retrieve the customer(s) with the highest account balance.

```
SELECT C.First_Name, C.Last_Name, A.Balance
FROM HMBank.dbo.Customer C
JOIN HMBank.dbo.Accounts A ON C.Customer_Id = A.Customer_Id
WHERE A.Balance = (SELECT MAX(Balance) FROM HMBank.dbo.Accounts);
```

	First_Name	Last_Name	Balance
1	Jane	Smith	5000

2. Calculate the average account balance for customers who have more than one account.

```
SELECT AVG(A.Balance) AS Avg_Balance
FROM HMBank.dbo.Accounts A
WHERE A.Customer_ID IN (
    SELECT Customer_ID
    FROM HMBank.dbo.Accounts
    GROUP BY Customer_ID
    HAVING COUNT(Account_Id) > 1
);
```

Avg_Balance
1 NULL

3. Retrieve accounts with transactions whose amounts exceed the average transaction amount.

```
SELECT *
FROM HMBank.dbo.Transactions
WHERE Amount > (SELECT AVG(Amount) FROM HMBank.dbo.Transactions);
```

Transaction_Id	Account_Id	Transaction_Type	Amount	Transaction_Date
1 2	2	Withdrawal	2000	2024-02-15
2 6	6	Withdrawal	1500	2024-06-15
3 8	8	Deposit	1200	2024-08-20

4. Identify customers who have no recorded transactions.

```
SELECT C.First_Name, C.Last_Name
FROM HMBank.dbo.Customer C
WHERE NOT EXISTS (
    SELECT 1 FROM HMBank.dbo.Transactions T
    JOIN HMBank.dbo.Accounts A ON T.Account_Id = A.Account_Id
    WHERE C.Customer_Id = A.Customer_Id
);
```

First_Name	Last_Name
1 Emma	Jones
2 Sophia	Davis

5. Calculate the total balance of accounts with no recorded transactions.

```
SELECT SUM(Balance)
FROM HMBank.dbo.Accounts A
WHERE NOT EXISTS (
    SELECT 1 FROM HMBank.dbo.Transactions T
    WHERE T.Account_Id = A.Account_Id
);
```

(No column name)
1 2700

6. Retrieve transactions for accounts with the lowest balance.

```
SELECT TOP 10 *
FROM HMBank.dbo.Accounts
ORDER BY Balance DESC;
```

Account_Id	Customer_ID	Account_Type	Balance
1 2	2	Checking	5000
2 8	8	Checking	3200
3 1	1	Savings	3000
4 3	3	Savings	3000
5 4	4	Checking	2500
6 12	2	Checking	2000
7 10	10	Checking	800
8 11	1	Savings	700
9 9	9	Savings	500
10 6	6	Checking	0

7. Identify customers who have accounts of multiple types.

```
SELECT C.First_Name, C.Last_Name
FROM HMBank.dbo.Customer C
WHERE C.Customer_Id IN (
    SELECT Customer_ID
    FROM HMBank.dbo.Accounts
    GROUP BY Customer_ID
    HAVING COUNT(DISTINCT Account_Type) > 1
);
```

110 %

	First_Name	Last_Name
1	John	Doe
2	Emily	Johnson

8. Calculate the percentage of each account type out of the total number of accounts.

```
SELECT Account_Type,
    COUNT(*) * 100.0 / (SELECT COUNT(*) FROM HMBank.dbo.Accounts) AS Percentage
FROM HMBank.dbo.Accounts
GROUP BY Account_Type;
```

10 %

	Account_Type	Percentage
1	Checking	60.000000000000000
2	Savings	40.000000000000000

9. Retrieve all transactions for a customer with a given customer_id.

```
SELECT T.*
FROM HMBank.dbo.Transactions T
JOIN HMBank.dbo.Accounts A ON T.Account_Id = A.Account_Id
WHERE A.Customer_ID = 1;
```

110 %

	Transaction_Id	Account_Id	Transaction_Type	Amount	Transaction_Date
1	1	1	Deposit	1000	2024-01-01

10. Calculate the total balance for each account type, including a subquery within the SELECT clause.

```
SELECT Account_Type,
    (SELECT SUM(Balance) FROM HMBank.dbo.Accounts A2 WHERE A2.Account_Type = A.Account_Type)
    AS Total_Balance
FROM HMBank.dbo.Accounts A
GROUP BY Account_Type;
```

110 %

	Account_Type	Total_Balance
1	Checking	13500
2	Savings	7200