BANK OF SAIT
ARTICLE
Written by: Amritpal Singh

Introduction:

SAIT Bank is a trusted financial institution dedicated to providing secure, innovative, and customer-focused banking solutions, including savings, loans, and digital transaction services.

Mission Statement

To design and maintain a reliable, efficient, secure database system to serve all banking operations in handling customer data, financial transactions, and business processes for optimal service delivery, regulatory compliance, and decision-making.

OBJECTIVES:

1.Centralized Data Management: Ensure all customers, account, and transaction data are stored in a unified and easily accessible system to avoid redundancy and maintain data integrity.

2.Enhance Transaction Accuracy and Security: Automate the recording and tracking of deposits, withdrawals, and transfers while safeguarding sensitive data against unauthorized access.

3.Improve Operational Efficiency: Automate routine tasks such as account management, transaction recording, and loan processing to minimize errors and save time.

4.Enable Data-Driven Decision-Making: Use the database to generate insights through analytics, such as identifying trends in customer behavior, evaluating loan performance, and optimizing branch operations for strategic growth.

BUSINESS TRANSACTION RULES:

- A transaction must be fully completed or fully rolled back if any part fails.
- Transactions must maintain data integrity and follow banking constraints
- An account must exist and be active before any transaction can be made.
- Transactions should expire if not completed within a certain time
- Transactions above a certain limit must trigger an automatic security check.
- Transactions should be processed in real time for customer satisfaction.

Data Dictionary

PRELIMINARY LIST OF TABLES:

•BRANCH

•Accounts

•Customers

•Bankers

•Loan

•Borrowers

• Transactions

• Loan Payments

•Credit Cards

FINAL LIST OF TABLES:

•BRANCH

•Accounts

•Customers

•Employees

•Loan

•Transactions

• Credit cards

1.Branches

Branches	
Branchid	int
BranchName	Char
BranchAddress	Varchar
Asset	decimal

2.Account:

Account	
AccountId	int
AccountBalance	Decimal
AccountType	varchar

3.Employee:

Emoloyee	
EmployeeId	int
Employee Name	varchar
Job title	varchar
Address	text
EmailId	varchar
HireDate	date

4.Transaction:

Transaction	
TransactionId	int
TransactionType	varchar
TransactionMethod	varchar
TransactionDate	date
Amount	decimal

5.Loans:

Loans	
LoanID	int
IssuedAmount	Decimal
RemainingAmount	decimal

6.Customer:

Customer	
CustomerId	int
CustomerName	varchar
DateOfBirth	Date
MobileNumber	Varchar
Proofid	varchar

7.Credit Card

Credit Card	
CreditCardId	int
ExpiryDate	date
CardLimit	decimal

Explanation:

1. Branches Table

- BranchID (int): Unique identifier for each bank branch.
- BranchName (char): Name of the branch.
- BranchAddress (varchar): Physical location of the branch.
- Asset (decimal): Total financial assets held by the branch.

2. Account Table

- AccountID (int): Unique identifier for a bank account.
- AccountBalance (decimal): Current balance available in the account.
- AccountType (varchar): Type of account (e.g., savings, checking).

3. Employee Table

- EmployeeID (int): Unique identifier for each employee.
- EmployeeName (varchar): Full name of the employee.
- JobTitle (varchar): Role or designation of the employee in the bank (e.g., manager, teller).
- Address (text): Residential address of the employee.
- EmailID (varchar): Contact email address of the employee.
- HireDate (date): Date the employee was hired.

4. Transaction Table

- TransactionID (int): Unique identifier for each transaction.
- TransactionType (varchar): Type of transaction (e.g., deposit, withdrawal).
- TransactionMethod (varchar): Mode of transaction (e.g., online, cash).
- TransactionDate (date): Date the transaction was made.
- Amount (decimal): Monetary value involved in the transaction.

5. Loans Table

- LoanID (int): Unique identifier for each loan issued.
- IssuedAmount (decimal): Total amount issued for the loan.
- RemainingAmount (decimal): Balance left to be paid for the loan.

6. Customer Table

- CustomerID (int): Unique identifier for each customer.
- CustomerName (varchar): Full name of the customer.
- DateOfBirth (date): Customer’s date of birth.
- MobileNumber (varchar): Contact phone number of the customer.
- ProofID (varchar): Identity proof submitted by the customer (e.g., driver's license).

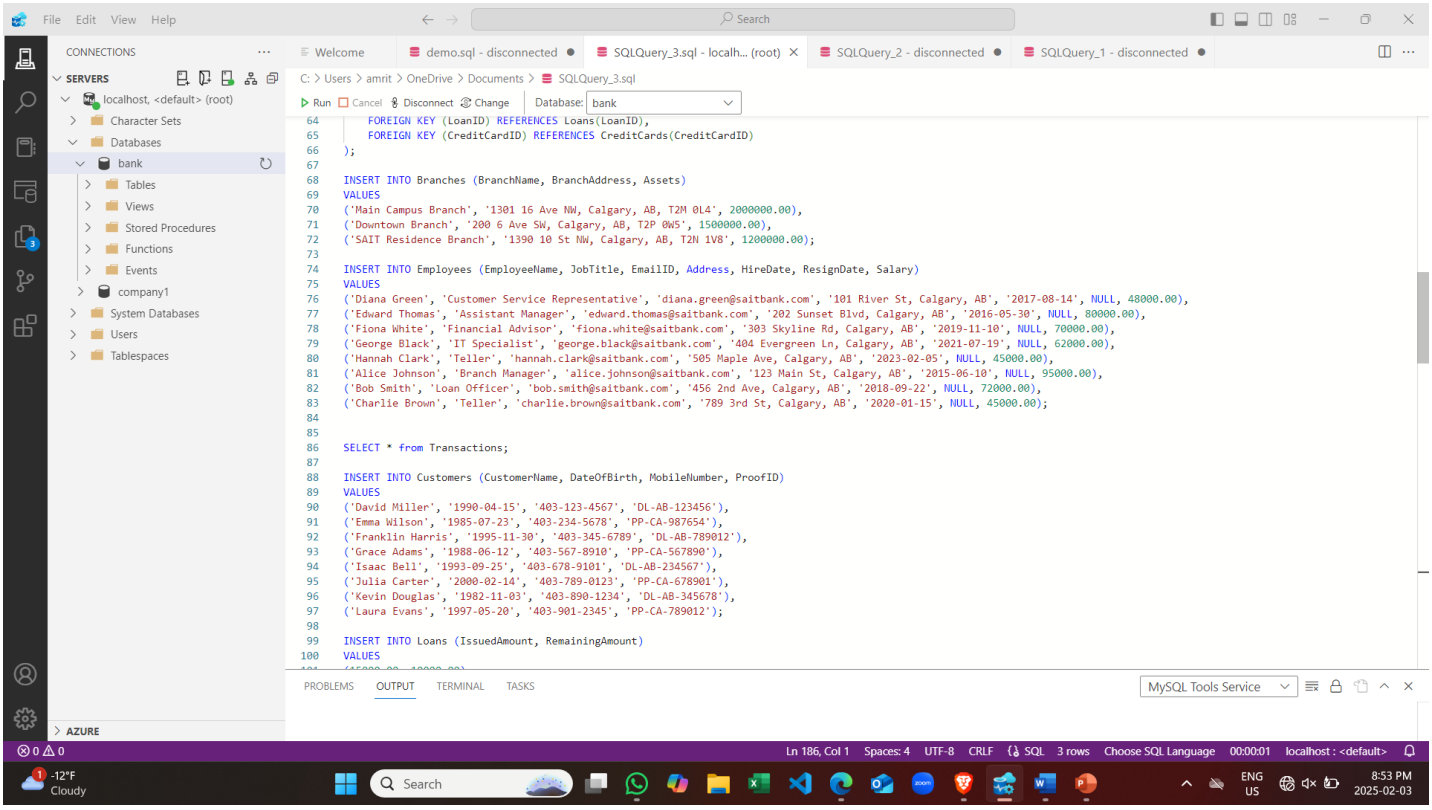
7. Credit Card Table

- CreditCardID (int): Unique identifier for each credit card.
- ExpiryDate (date): Expiration date of the credit card.
- CardLimit (decimal): Maximum spending limit of the credit card.

RELATIONSHIPS:

Relationship	Parent table	Child Table	Relationship Type
One Branch to Many Transactions	Branches	Transactions	One-to-Many (1:N)
One Employee to Many Transactions	Employees	Transactions	One-to-Many (1:N)
One Customer to Many Transactions	Customers	Transactions	One-to-Many (1:N)
One Account to Many Transactions	Accounts	Transactions	One-to-Many (1:N)
One Loan to Many Transactions	Loans	Transactions	One-to-Many (1:N)
One Credit Card to Many Transactions	Credit Cards	Transactions	One-to-Many (1:N)

Designing database: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SQLQuery_2 - disconnected
SQLQuery_1 - disconnected
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Run Cancel Disconnect Change
Database: bank
64 FOREIGN KEY (LoanID) REFERENCES Loans(LoanID),
65 FOREIGN KEY (CreditCardID) REFERENCES CreditCards(CreditCardID)
66);
67
68 INSERT INTO Branches (BranchName, BranchAddress, Assets)
69 VALUES
70 ('Main Campus Branch', '1301 16 Ave NW, Calgary, AB, T2M 0L4', 2000000.00),
71 ('Downtown Branch', '200 6 Ave SW, Calgary, AB, T2P 0W5', 1500000.00),
72 ('SAIT Residence Branch', '1390 10 St NW, Calgary, AB, T2N 1V8', 1200000.00);
73
74 INSERT INTO Employees (EmployeeName, JobTitle, EmailID, Address, HireDate, ResignDate, Salary)
75 VALUES
76 ('Diana Green', 'Customer Service Representative', 'diana.green@saitbank.com', '101 River St, Calgary, AB', '2017-08-14', NULL, 48000.00),
77 ('Edward Thomas', 'Assistant Manager', 'edward.thomas@saitbank.com', '202 Sunset Blvd, Calgary, AB', '2016-05-30', NULL, 80000.00),
78 ('Fiona White', 'Financial Advisor', 'fiona.white@saitbank.com', '303 Skyline Rd, Calgary, AB', '2019-11-10', NULL, 70000.00),
79 ('George Black', 'IT Specialist', 'george.black@saitbank.com', '404 Evergreen Ln, Calgary, AB', '2021-07-19', NULL, 62000.00),
80 ('Hannah Clark', 'Teller', 'hannah.clark@saitbank.com', '505 Maple Ave, Calgary, AB', '2023-02-05', NULL, 45000.00),
81 ('Alice Johnson', 'Branch Manager', 'alice.johnson@saitbank.com', '123 Main St, Calgary, AB', '2015-06-10', NULL, 95000.00),
82 ('Bob Smith', 'Loan Officer', 'bob.smith@saitbank.com', '456 2nd Ave, Calgary, AB', '2018-09-22', NULL, 72000.00),
83 ('Charlie Brown', 'Teller', 'charlie.brown@saitbank.com', '789 3rd St, Calgary, AB', '2020-01-15', NULL, 45000.00);
84
85
86 SELECT * from Transactions;
87
88 INSERT INTO Customers (CustomerName, DateOfBirth, MobileNumber, ProofID)
89 VALUES
90 ('David Miller', '1990-04-15', '403-123-4567', 'DL-AB-123456'),
91 ('Emma Wilson', '1985-07-23', '403-234-5678', 'PP-CA-987654'),
92 ('Franklin Harris', '1995-11-30', '403-345-6789', 'DL-AB-789012'),
93 ('Grace Adams', '1988-06-12', '403-567-8910', 'PP-CA-567890'),
94 ('Isaac Bell', '1993-09-25', '403-678-9101', 'DL-AB-234567'),
95 ('Julia Carter', '2000-02-14', '403-789-0123', 'PP-CA-678901'),
96 ('Kevin Douglas', '1982-11-03', '403-890-1234', 'DL-AB-345678'),
97 ('Laura Evans', '1997-05-20', '403-901-2345', 'PP-CA-789012');
98
99 INSERT INTO Loans (IssuedAmount, RemainingAmount)
100 VALUES
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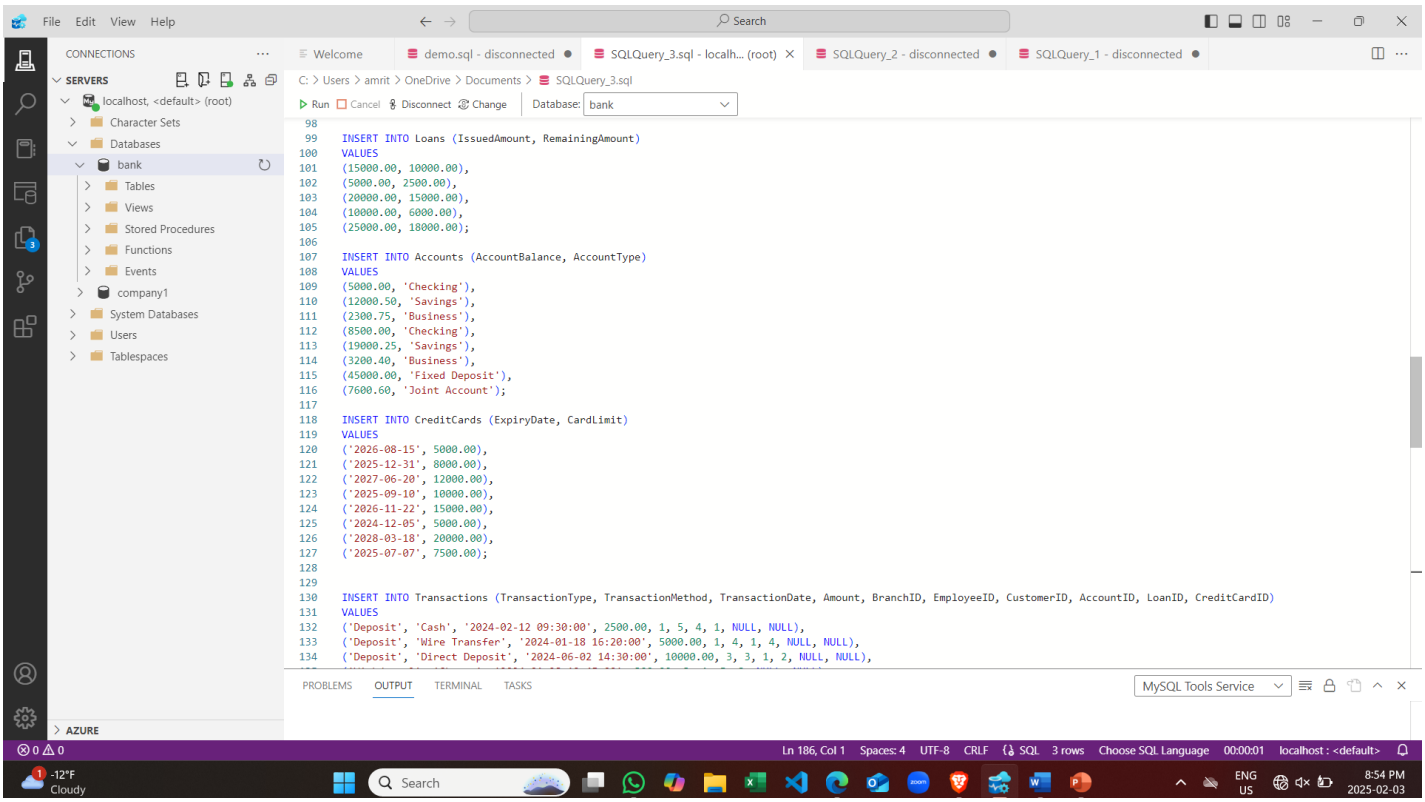
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SQLQuery_2 - disconnected
SQLQuery_1 - disconnected
C: > Users > amrit > OneDrive > Documents > SQLQuery_3.sql
Run Cancel Disconnect Change
Database: bank
98
99 INSERT INTO Loans (IssuedAmount, RemainingAmount)
100 VALUES
101 (15000.00, 10000.00),
102 (5000.00, 2500.00),
103 (20000.00, 15000.00),
104 (10000.00, 6000.00),
105 (25000.00, 18000.00);
106
107 INSERT INTO Accounts (AccountBalance, AccountType)
108 VALUES
109 (5000.00, 'Checking'),
110 (12000.50, 'Savings'),
111 (2300.75, 'Business'),
112 (8500.00, 'Checking'),
113 (19000.25, 'Savings'),
114 (3200.40, 'Business'),
115 (45000.00, 'Fixed Deposit'),
116 (7600.60, 'Joint Account');
117
118 INSERT INTO CreditCards (ExpiryDate, CardLimit)
119 VALUES
120 ('2026-08-15', 5000.00),
121 ('2025-12-31', 8000.00),
122 ('2027-06-20', 12000.00),
123 ('2025-09-10', 10000.00),
124 ('2026-11-22', 15000.00),
125 ('2024-12-05', 5000.00),
126 ('2028-03-18', 20000.00),
127 ('2025-07-07', 7500.00);
128
129
130 INSERT INTO Transactions (TransactionType, TransactionMethod, TransactionDate, Amount, BranchID, EmployeeID, CustomerID, AccountID, LoanID, CreditCardID)
131 VALUES
132 ('Deposit', 'Cash', '2024-02-12 09:30:00', 2500.00, 1, 5, 4, 1, NULL, NULL),
133 ('Deposit', 'Wire Transfer', '2024-01-18 16:20:00', 5000.00, 1, 4, 1, 4, NULL, NULL),
134 ('Deposit', 'Direct Deposit', '2024-06-02 14:30:00', 10000.00, 3, 3, 1, 2, NULL, NULL),
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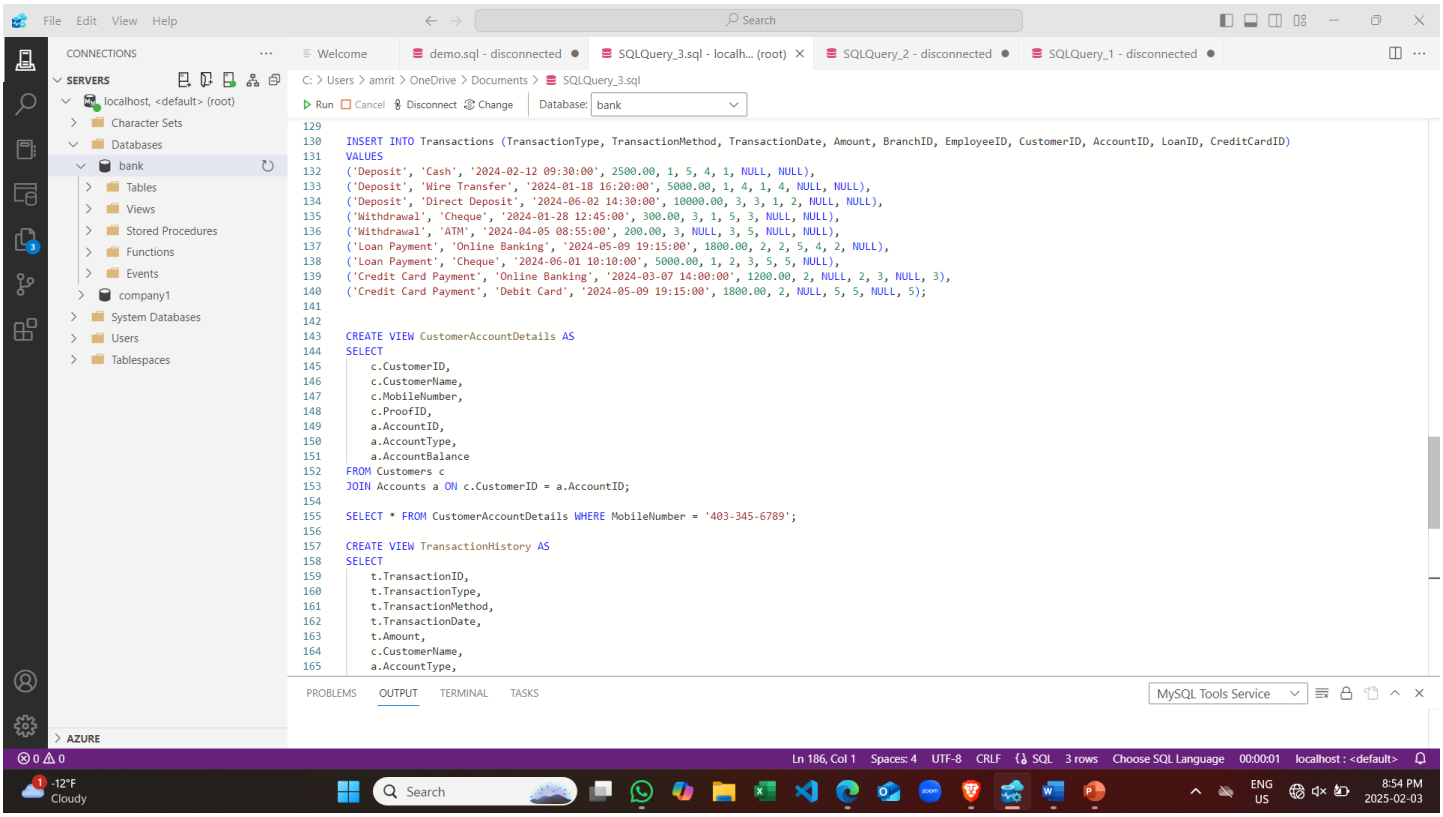
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VALUES
('Deposit', 'Cash', '2024-02-12 09:30:00', 2500.00, 1, 5, 4, 1, NULL, NULL),
('Deposit', 'Wire Transfer', '2024-01-18 16:20:00', 5000.00, 1, 4, 1, 4, NULL, NULL),
('Deposit', 'Direct Deposit', '2024-06-02 14:30:00', 10000.00, 3, 3, 1, 2, NULL, NULL),
('Withdrawal', 'Cheque', '2024-01-28 12:45:00', 300.00, 3, 1, 5, 3, NULL, NULL),
('Withdrawal', 'ATM', '2024-04-05 08:55:00', 200.00, 3, NULL, 3, 5, NULL, NULL),
('Loan Payment', 'Online Banking', '2024-05-09 19:15:00', 1800.00, 2, 2, 5, 4, 2, NULL),
('Loan Payment', 'Cheque', '2024-06-01 10:10:00', 5000.00, 1, 2, 3, 5, 5, NULL),
('Credit Card Payment', 'Online Banking', '2024-03-07 14:00:00', 1200.00, 2, NULL, 2, 3, NULL, 3),
('Credit Card Payment', 'Debit Card', '2024-05-09 19:15:00', 1800.00, 2, NULL, 5, 5, NULL, 5);
CREATE VIEW CustomerAccountDetails AS
SELECT
c.CustomerID,
c.CustomerName,
c.MobileNumber,
c.ProofID,
a.AccountID,
a.AccountType,
a.AccountBalance
FROM Customers c
JOIN Accounts a ON c.CustomerID = a.AccountID;
SELECT * FROM CustomerAccountDetails WHERE MobileNumber = '403-345-6789';
CREATE VIEW TransactionHistory AS
SELECT
t.TransactionID,
t.TransactionType,
t.TransactionMethod,
t.TransactionDate,
t.Amount,
c.CustomerName,
a.AccountType,
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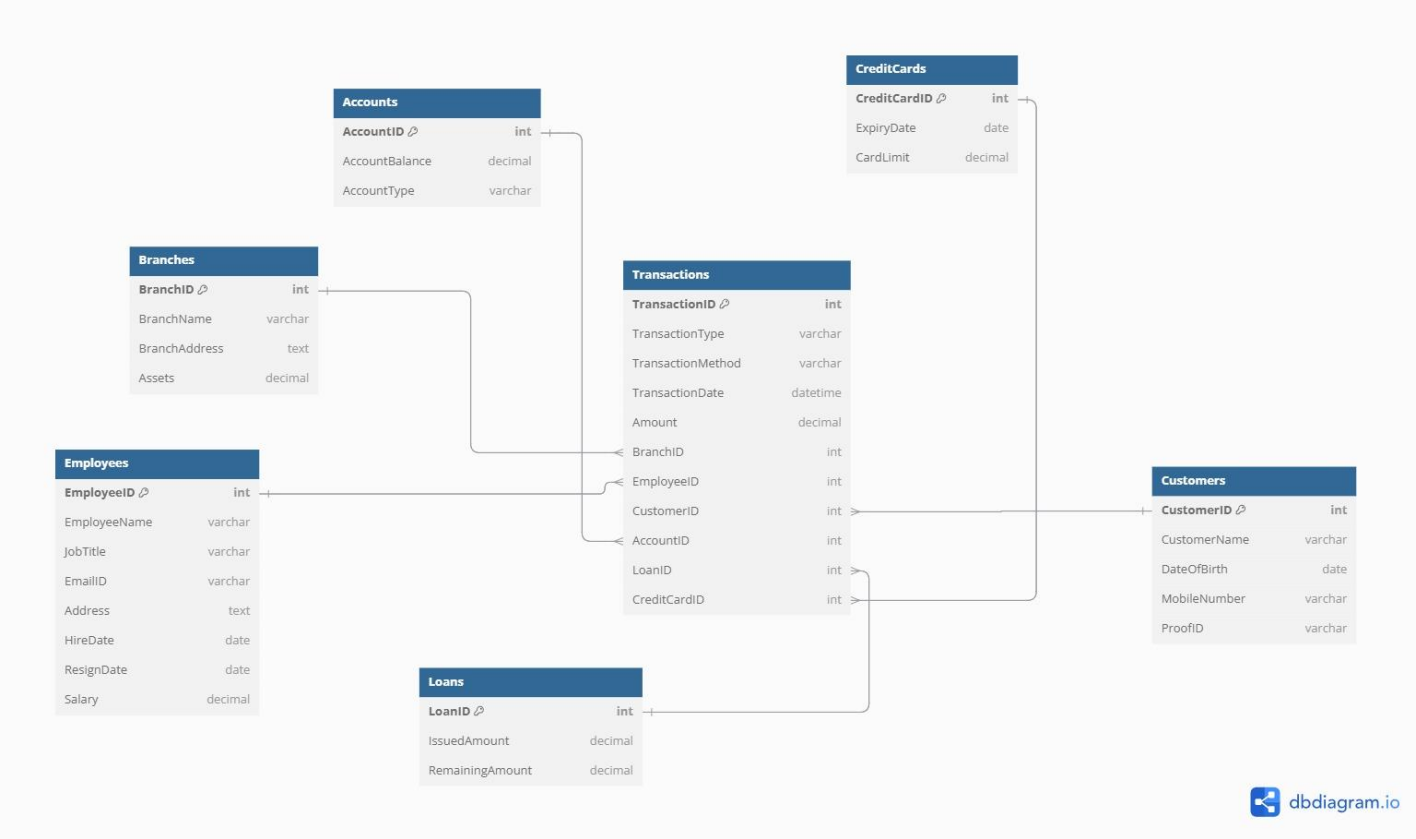
Entity Relationship Diagram



Conclusion:

This project focused on building a secure and efficient database system for banking operations. It ensures centralized data management, improves transaction accuracy, and automates routine tasks like account management and loan processing. The system supports real-time transactions, protects data, and follows banking rules to maintain integrity. With a well-structured table design, it helps the bank manage branches, accounts, customers, loans, and transactions efficiently while enabling better decision-making and growth.