Brief Description of the System

The aim of this project is to develop a comprehensive mobile banking application that provides users with secure and convenient access to their financial accounts and services. This app is designed to meet the growing need for efficient, on-the-go banking, allowing users to manage their finances anytime, anywhere, with minimal effort.

Through this application, users can perform various banking transactions, including checking account balances, transferring funds, managing loans, and investing in different financial products. The application prioritizes data security, ensuring that customers' sensitive information is safeguarded and transactions are conducted safely.

System Goals:

1. Provide secure and convenient banking services.
2. Ensure the protection of customer data and financial transactions.
3. Offer a wide range of financial services, from basic banking to investments.
4. Enable users to monitor and manage multiple accounts from a single platform.

Scope Definition

The banking system is a mobile application that allows users to handle a variety of banking services, including account management, fund transfers, loan applications, and investment tracking.

System Requirements:

1. Customers can register and log into the app with their personal credentials.
2. The app allows users to view and manage multiple bank accounts, including checking, savings, and investment accounts.
3. Customers can transfer funds between accounts or to external accounts securely.
4. The application supports viewing and applying for loans, with details on interest rates, terms, and monthly payments.
5. Users can track and manage credit and debit cards, viewing transaction histories and checking balances.
6. The system supports investment options, such as stocks, retirement plans, and foreign exchange transactions.
7. Customers can set up and manage recurring transactions and bill payments.

General Business Rules

1.Customer Records: A single record is maintained for each customer, containing basic information and address details.

2.Customer Addresses: A customer can have only one address, which is stored in a separate table.

3.Customer Accounts: A customer can open multiple types of accounts (bank account, credit card, deposit account, stock account).

Customer-Related Rules

4.Customer Address: A customer can be associated with only one address (Customer.Address_ID references Customer_Address.Address_ID).

5.Bank Accounts: A customer can own multiple bank accounts, but each bank account belongs to only one customer.

6.Credit Cards: Each credit card must be linked to a customer. A customer can have multiple credit cards.

7.Deposit Accounts: A customer can have multiple deposit accounts, but each deposit account belongs to only one customer.

8.Stock Accounts: A customer can have one stock account, each stock account belongs to only one customer.

Account-Related Rules

9.Bank Account Transactions: Each bank account can have multiple transactions recorded, including transaction type, date, and amount.

10.Deposit Account Transactions: Each deposit account can have multiple deposit transaction records.

11.Stock Transactions: A stock account can have multiple stock purchase or sale transaction records.

Card-Related Rules

12.Credit Cards: Each credit card must be linked to customer details and store information such as credit limit, type, and expiration date.

Debit Card and Bank Account: A debit card must be linked to a bank account, and each debit card can only be associated with one bank account.

Loan and Deposit Rules

14.	Loan Applications: Each loan application must be linked to a customer and include details such as the application date, requested amount, and status.

15.	Loans: Approved loans must be associated with a loan application. Each loan includes start and end dates, interest rate, and monthly payment details.

Transaction Rules

16.	Currency Conversion: Bank transactions must store the source currency and target currency information.

17.	Stock Trading: Each stock transaction must specify the transaction type (buy or sell), stock symbol, amount, and price per share.

18.	Deposit Interest Rates: Each deposit account must include an interest rate and maturity date.

Entities

1. Customer

The individual holding a bank account in the system.

2. Customer Address

Stores the address information for customers.

3. Bank Account

Represents bank accounts associated with each customer.

4. Card

Stores information about cards linked to a bank account.

5. Transaction

Logs all transactions made on a bank account.

6. Loan

Represents a loan that a customer has taken.

7. Loan Application

Stores data about loan applications submitted by customers.

8.Credit Card

A payment tool linked to a bank account that allows spending within a specified credit limit.

9. Stock Account

Represents an investment account holding stocks.

10. Stock Transaction

Logs stock transactions within a stock account.

11. Deposit Account

Holds information for a deposit account within the investment system.

12. Deposit Transaction

Logs transactions within a deposit account.

Components of the Entity Relationship Model

ENTITY	CONNECTIVITY	ENTITY
Customer	1 - *	Customer_Address
Customer	1 - *	Bank_Account
Bank_Account	1 - 1	Debit_Card
Bank_Account	1 - *	Transaction
Customer	1 - *	Loan_Application
Loan_Application	1 – 1	Loan
Customer	1 - *	Deposit_Account
Customer	1 - *	Credit_Card
Stock_Account	1 - *	Stock_Transaction
Deposit_Account	1 - *	Deposit_Transaction
Customer	1 - 1	Stock_Account
Customer	1 - *	Deposit_Account

Table Name	Attribute Name	Contents	Type	Format	Required	PK/FK	FK Referenced Table
Customer	Customer_ID	Unique identifier for each customer	INT	NA	Y	PK	
	Customer_FName	Customer's first name	VARCHAR(25)	NA	Y		
	Customer_LName	Customer's last name	VARCHAR(25)	NA	Y		
	Customer_PNumber	Customer's phone number	VARCHAR(25)	NA	N		
	Address_ID	Customer's address ID	INT	NA	Y	FK	Address
Address	Address_ID	Unique identifier for each address	INT	NA	Y	PK	
	Country	Country of the address	VARCHAR(25)	NA	Y		
	City	City of the address	VARCHAR(25)	NA	Y		
	Street	Street of the address	VARCHAR(25)	NA	Y		
	Zip_code	Zip code of the address	VARCHAR(10)	NA	Y		
Bank_Account	BankAccount_ID	Unique identifier for each bank account	INT	NA	Y	PK	
	Customer_ID	ID of the customer holding this account	INT	NA	Y	FK	Customer
	Account_Type	Type of bank account	VARCHAR(25)	NA	Y		
	Balance	Current balance in the account	DECIMAL(10,2)	NA	Y		
	Open_Date	Account opening date	DATE	dd-mm-yyyy	Y		
Card	Card_No	Unique card number	VARCHAR(25)	NA	Y	PK	
	BankAccount_ID	Bank account associated with the card	INT	NA	Y	FK	Bank_Account
	Card_Type	Type of card (e.g., credit, debit)	VARCHAR(25)	NA	Y		
	Expiration_Date	Card expiration date	DATE	mm-yyyy	Y		
	CVV	Card CVV code	SMALLINT	###	Y		
Transaction	Transaction_ID	Unique identifier for each transaction	INT	NA	Y	PK	
	BankAccount_ID	Bank account associated with the transaction	INT	NA	Y	FK	Bank_Account
	Transaction_Type	Type of transaction (e.g., deposit, withdrawal)	VARCHAR(25)	NA	Y		
	Amount	Transaction amount	DECIMAL(10,2)	NA	Y		
	Transaction_Date	Date of the transaction	DATE	dd-mm-yyyy	Y		
Loan	Loan_ID	Unique identifier for each loan	INT	NA	Y	PK	
	LoanApp_ID	Loan application associated with loan	INT	NA	Y	FK	Loan_Application
	Interest_Rate	Interest rate for the loan	DECIMAL(5,2)	NA	Y		
	Loan_Term	Loan term in months	INT	NA	Y		
	Monthly_Payment	Monthly payment for the loan	DECIMAL(10,2)	NA	Y		
	Start_Date	Start date of the loan	DATE	dd-mm-yyyy	Y		
	End_Date	End date of the loan	DATE	dd-mm-yyyy	Y		
	Status	Loan status	VARCHAR(25)	NA	Y		
Loan_Application	LoanApp_ID	Unique identifier for each loan application	INT	NA	Y	PK	
	BankAccount_ID	Bank account associated with the loan application	INT	NA	Y	FK	Bank_Account
	Loan_Type	Type of loan applied for	VARCHAR(25)	NA	Y		
	Amount_Request	Amount requested	DECIMAL(10,2)	NA	Y		
Foreign_Exchange	ForeignExchange_ID	Unique identifier for each foreign exchange	INT	NA	Y	PK	
	Customer_ID	ID of the customer involved in the exchange	INT	NA	Y	FK	Customer
	From_Currency	Currency being exchanged from	VARCHAR(10)	NA	Y		
	To_Currency	Currency being exchanged to	VARCHAR(10)	NA	Y		
	Exchange_Rate	Exchange rate used in the transaction	DECIMAL(10,4)	NA	Y		
	Amount	Amount exchanged	DECIMAL(10,2)	NA	Y		
	Transaction_Date	Date of the exchange transaction	DATE	dd-mm-yyyy	Y		
Contribution	Contribution_ID	Unique identifier for each contribution	INT	NA	Y	PK	
	Retirement_ID	Associated retirement account ID	INT	NA	Y	FK	IndividualRetirement_Account
	Amount	Amount of contribution	DECIMAL(10,2)	NA	Y		
	Contribution_Date	Date of contribution	DATE	dd-mm-yyyy	Y		
	Status	Status of the contribution	VARCHAR(25)	NA	Y		
IndividualRetirement_Account	Retirement_ID	Unique identifier for each retirement account	INT	NA	Y	PK	
	Customer_ID	Customer associated with the retirement account	INT	NA	Y	FK	Customer
	RetPlan_ID	Associated retirement plan ID	INT	NA	Y	FK	Retirement_Plan
	Current_Balance	Current balance in the retirement account	DECIMAL(10,2)	NA	Y		
	Start_Date	Account start date	DATE	dd-mm-yyyy	Y		
	Status	Status of the retirement account	VARCHAR(25)	NA	Y		
Fund	Fund_ID	Unique identifier for each fund	INT	NA	Y	PK	Fund_Allocation
	Fund_Name	Name of the fund	VARCHAR(25)	NA	Y		
	Risk_Level	Risk level of the fund	VARCHAR(25)	NA	Y		
	Description	Description of the fund	TEXT	NA	N		
	Return_Rate	Return rate of the fund	DECIMAL(5,2)	NA	Y		
Fund_Allocation	FundAll_ID	Unique identifier for each fund allocation	INT	NA	Y	PK	
	Allocation_Percentage	Percentage allocated to the fund	DECIMAL(5,2)	0-100%	Y		
	Fund_ID	Associated fund ID	INT	NA	Y	FK	Fund
Stock_Account	StockAccount_ID	Unique identifier for each stock account	INT	NA	Y	PK	
	InvAccount_ID	Investment account associated with the stock account	INT	NA	Y	FK	Investment_Account
	Balance	Current balance in the stock account	DECIMAL(10,2)	NA	Y		
	Open_Date	Stock account opening date	DATE	dd-mm-yyyy	Y		
	Status	Account status	VARCHAR(25)	NA	Y		
Retirement_Plan	RetPlan_ID	Unique identifier for each retirement plan	INT	NA	Y	PK	Customer
	RetPlan_Name	Name of the retirement plan	VARCHAR(25)	NA	Y		
	Description	Description of the retirement plan	TEXT	NA	N		
	Minimum_Contribution	Minimum contribution required for the plan	DECIMAL(10,2)	NA	Y		
Deposit_Account	DepositAccount_ID	Unique ID for the deposit account	INT	NA	Y	PK	
	InvAccount_ID	Links to the investment account	INT	NA	Y	FK	Investment_Account
	Currency_Type	Type of currency	VARCHAR(25)	NA	Y		
	Balance	Account balance	DECIMAL(10,2)	NA	Y		
	Interest_Rate	Interest rate	DECIMAL(5,2)	0-100%	Y		
	Maturity_Date	Date of maturity	DATE	dd-mm-yyyy	Y		
	Status	Account status	VARCHAR(25)	NA	Y		
Invesment_Account	InvAccount_ID	Unique ID for investment account	INT	NA	Y	PK	
	Customer_ID	Unique identifier for each customer	INT	NA	Y	FK	Customer
	Balance	Account balance	DECIMAL(10,2)	NA	Y		
	Open_Date	Account opening date	DATE	dd-mm-yyyy	Y		
	Status	Account status	VARCHAR(25)	NA	Y		
Stock_Transaction	StockTransaction_ID	Unique ID for Stock Transaction account	INT	NA	Y	PK	
	StockAccount_ID	Links to the Stock account	INT	NA	Y	FK	Stock_Account
	Stock_Symbol	Symbol of Stock	VARCHAR(25)	NA	Y		
	Transaction_Type	Type of transaction	VARCHAR(25)	NA	Y		
	Share_Amount	Amount of share	DECIMAL(10,2)	NA	Y		
	PricePer_Share	Price per share	DECIMAL(10,2)	NA	Y		
	Transaction_Date	Date of transaction	DATE	dd-mm-yyyy	Y		
Currency_Account	CurAccount_ID	Unique ID for Currency account	INT	NA	Y	PK	
	ForeignExchange_ID	Links to the Foreign Exchange	INT	NA	Y	FK	Foreign_Exchange
	Currency_Type	Type of currency	VARCHAR(25)	NA	Y		
	Balance	Balance	DECIMAL(10,2)	NA	Y		
	Open_Date	Date of open	DATE	dd-mm-yyyy	Y		
	Status	Account status	VARCHAR(25)	NA	Y		