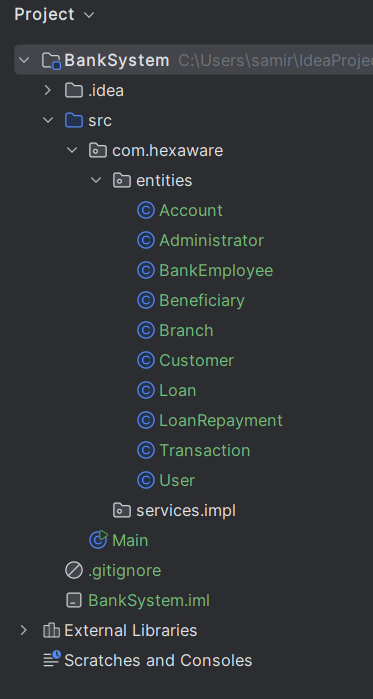
**NAME: SHUBHI TARAN**

**CASE STUDY : MAVERICKS BANK (12)**

**ER DIAGRAM:**

**SUBMITTED INDIVIDUAL .io FILE ON GITHUB**

**MODEL ENTITIES CODE AND STRUCTURE:**



ACCOUNT

package com.hexaware.entities;  
  
import java.math.BigDecimal;  
import java.sql.Timestamp;  
  
public class Account {  
 private long accountId;  
 private long customerId;  
 private String accountType;  
 private String accountNumber;  
 private String ifscCode;  
 private long branchId;  
 private BigDecimal balance;  
 private String status;  
 private Timestamp createdAt;  
 private Timestamp updatedAt;  
  
 public Account() {  
 }  
  
 public long getAccountId() {  
 return accountId;  
 }  
  
 public void setAccountId(long accountId) {  
 this.accountId = accountId;  
 }  
  
 public long getCustomerId() {  
 return customerId;  
 }  
  
 public void setCustomerId(long customerId) {  
 this.customerId = customerId;  
 }  
  
 public String getAccountType() {  
 return accountType;  
 }  
  
 public void setAccountType(String accountType) {  
 this.accountType = accountType;  
 }  
  
 public String getAccountNumber() {  
 return accountNumber;  
 }  
  
 public void setAccountNumber(String accountNumber) {  
 this.accountNumber = accountNumber;  
 }  
  
 public String getIfscCode() {  
 return ifscCode;  
 }  
  
 public void setIfscCode(String ifscCode) {  
 this.ifscCode = ifscCode;  
 }  
  
 public long getBranchId() {  
 return branchId;  
 }  
  
 public void setBranchId(long branchId) {  
 this.branchId = branchId;  
 }  
  
 public BigDecimal getBalance() {  
 return balance;  
 }  
  
 public void setBalance(BigDecimal balance) {  
 this.balance = balance;  
 }  
  
 public String getStatus() {  
 return status;  
 }  
  
 public void setStatus(String status) {  
 this.status = status;  
 }  
  
 public Timestamp getCreatedAt() {  
 return createdAt;  
 }  
  
 public void setCreatedAt(Timestamp createdAt) {  
 this.createdAt = createdAt;  
 }  
  
 public Timestamp getUpdatedAt() {  
 return updatedAt;  
 }  
  
 public void setUpdatedAt(Timestamp updatedAt) {  
 this.updatedAt = updatedAt;  
 }  
  
 public static enum AccountType {  
 *Savings*, *Checking*, *Business* }  
  
 public static enum AccountStatus {  
 *Active*, *Pending*, *Closed* }  
}

ADMINISTRATOR

package com.hexaware.entities;  
  
import java.sql.Timestamp;  
  
public class Administrator {  
 private long adminId;  
 private String name;  
 private String email;  
 private String password;  
 private Timestamp createdAt;  
 private Timestamp updatedAt;  
 private long userId;  
  
 public Administrator() {  
 }  
  
 public long getAdminId() {  
 return adminId;  
 }  
  
 public void setAdminId(long adminId) {  
 this.adminId = adminId;  
 }  
  
 public String getName() {  
 return name;  
 }  
  
 public void setName(String name) {  
 this.name = name;  
 }  
  
 public String getEmail() {  
 return email;  
 }  
  
 public void setEmail(String email) {  
 this.email = email;  
 }  
  
 public String getPassword() {  
 return password;  
 }  
  
 public void setPassword(String password) {  
 this.password = password;  
 }  
  
 public Timestamp getCreatedAt() {  
 return createdAt;  
 }  
  
 public void setCreatedAt(Timestamp createdAt) {  
 this.createdAt = createdAt;  
 }  
  
 public Timestamp getUpdatedAt() {  
 return updatedAt;  
 }  
  
 public void setUpdatedAt(Timestamp updatedAt) {  
 this.updatedAt = updatedAt;  
 }  
  
 public long getUserId() {  
 return userId;  
 }  
  
 public void setUserId(long userId) {  
 this.userId = userId;  
 }  
}

BANKEMPLOYEE

package com.hexaware.entities;  
  
import java.sql.Timestamp;  
  
public class BankEmployee {  
 private long employeeId;  
 private String name;  
 private String email;  
 private String password;  
 private String role;  
 private Timestamp createdAt;  
 private Timestamp updatedAt;  
 private long userId;  
  
 public BankEmployee() {  
 }  
  
 public long getEmployeeId() {  
 return employeeId;  
 }  
  
 public void setEmployeeId(long employeeId) {  
 this.employeeId = employeeId;  
 }  
  
 public String getName() {  
 return name;  
 }  
  
 public void setName(String name) {  
 this.name = name;  
 }  
  
 public String getEmail() {  
 return email;  
 }  
  
 public void setEmail(String email) {  
 this.email = email;  
 }  
  
 public String getPassword() {  
 return password;  
 }  
  
 public void setPassword(String password) {  
 this.password = password;  
 }  
  
 public String getRole() {  
 return role;  
 }  
  
 public void setRole(String role) {  
 this.role = role;  
 }  
  
 public Timestamp getCreatedAt() {  
 return createdAt;  
 }  
  
 public void setCreatedAt(Timestamp createdAt) {  
 this.createdAt = createdAt;  
 }  
  
 public Timestamp getUpdatedAt() {  
 return updatedAt;  
 }  
  
 public void setUpdatedAt(Timestamp updatedAt) {  
 this.updatedAt = updatedAt;  
 }  
  
 public long getUserId() {  
 return userId;  
 }  
  
 public void setUserId(long userId) {  
 this.userId = userId;  
 }  
}

BENEFICIARY

package com.hexaware.entities;  
  
import java.sql.Timestamp;  
  
public class Beneficiary {  
 private long beneficiaryId;  
 private long customerId;  
 private String accountName;  
 private String accountNumber;  
 private String bankName;  
 private String branchName;  
 private String ifscCode;  
 private Timestamp createdAt;  
  
 public Beneficiary() {  
 }  
  
 public long getBeneficiaryId() {  
 return beneficiaryId;  
 }  
  
 public void setBeneficiaryId(long beneficiaryId) {  
 this.beneficiaryId = beneficiaryId;  
 }  
  
 public long getCustomerId() {  
 return customerId;  
 }  
  
 public void setCustomerId(long customerId) {  
 this.customerId = customerId;  
 }  
  
 public String getAccountName() {  
 return accountName;  
 }  
  
 public void setAccountName(String accountName) {  
 this.accountName = accountName;  
 }  
  
 public String getAccountNumber() {  
 return accountNumber;  
 }  
  
 public void setAccountNumber(String accountNumber) {  
 this.accountNumber = accountNumber;  
 }  
  
 public String getBankName() {  
 return bankName;  
 }  
  
 public void setBankName(String bankName) {  
 this.bankName = bankName;  
 }  
  
 public String getBranchName() {  
 return branchName;  
 }  
  
 public void setBranchName(String branchName) {  
 this.branchName = branchName;  
 }  
  
 public String getIfscCode() {  
 return ifscCode;  
 }  
  
 public void setIfscCode(String ifscCode) {  
 this.ifscCode = ifscCode;  
 }  
  
 public Timestamp getCreatedAt() {  
 return createdAt;  
 }  
  
 public void setCreatedAt(Timestamp createdAt) {  
 this.createdAt = createdAt;  
 }  
}

BRANCH

package com.hexaware.entities;  
  
import java.sql.Timestamp;  
  
public class Branch {  
 private long branchId;  
 private String bankName;  
 private String branchName;  
 private String ifscCode;  
 private String address;  
 private Timestamp createdAt;  
  
 public Branch() {  
 }  
  
 public long getBranchId() {  
 return branchId;  
 }  
  
 public void setBranchId(long branchId) {  
 this.branchId = branchId;  
 }  
  
 public String getBankName() {  
 return bankName;  
 }  
  
 public void setBankName(String bankName) {  
 this.bankName = bankName;  
 }  
  
 public String getBranchName() {  
 return branchName;  
 }  
  
 public void setBranchName(String branchName) {  
 this.branchName = branchName;  
 }  
  
 public String getIfscCode() {  
 return ifscCode;  
 }  
  
 public void setIfscCode(String ifscCode) {  
 this.ifscCode = ifscCode;  
 }  
  
 public String getAddress() {  
 return address;  
 }  
  
 public void setAddress(String address) {  
 this.address = address;  
 }  
  
 public Timestamp getCreatedAt() {  
 return createdAt;  
 }  
  
 public void setCreatedAt(Timestamp createdAt) {  
 this.createdAt = createdAt;  
 }  
}

CUSTOMER

import java.sql.Date;  
import java.sql.Timestamp;  
  
public class Customer {  
 private long customerId;  
 private String name;  
 private String email;  
 private String password;  
 private String contactNumber;  
 private String address;  
 private Date dateOfBirth;  
 private int age;  
 private String aadharNumber;  
 private String panNumber;  
 private Timestamp createdAt;  
 private Timestamp updatedAt;  
 private long userId;  
  
 public Customer() {  
 }  
  
 public long getCustomerId() {  
 return customerId;  
 }  
  
 public void setCustomerId(long customerId) {  
 this.customerId = customerId;  
 }  
  
 public String getName() {  
 return name;  
 }  
  
 public void setName(String name) {  
 this.name = name;  
 }  
  
 public String getEmail() {  
 return email;  
 }  
  
 public void setEmail(String email) {  
 this.email = email;  
 }  
  
 public String getPassword() {  
 return password;  
 }  
  
 public void setPassword(String password) {  
 this.password = password;  
 }  
  
 public String getContactNumber() {  
 return contactNumber;  
 }  
  
 public void setContactNumber(String contactNumber) {  
 this.contactNumber = contactNumber;  
 }  
  
 public String getAddress() {  
 return address;  
 }  
  
 public void setAddress(String address) {  
 this.address = address;  
 }  
  
 public Date getDateOfBirth() {  
 return dateOfBirth;  
 }  
  
 public void setDateOfBirth(Date dateOfBirth) {  
 this.dateOfBirth = dateOfBirth;  
 }  
  
 public int getAge() {  
 return age;  
 }  
  
 public void setAge(int age) {  
 this.age = age;  
 }  
  
 public String getAadharNumber() {  
 return aadharNumber;  
 }  
  
 public void setAadharNumber(String aadharNumber) {  
 this.aadharNumber = aadharNumber;  
 }  
  
 public String getPanNumber() {  
 return panNumber;  
 }  
  
 public void setPanNumber(String panNumber) {  
 this.panNumber = panNumber;  
 }  
  
 public Timestamp getCreatedAt() {  
 return createdAt;  
 }  
  
 public void setCreatedAt(Timestamp createdAt) {  
 this.createdAt = createdAt;  
 }  
  
 public Timestamp getUpdatedAt() {  
 return updatedAt;  
 }  
  
 public void setUpdatedAt(Timestamp updatedAt) {  
 this.updatedAt = updatedAt;  
 }  
  
 public long getUserId() {  
 return userId;  
 }  
  
 public void setUserId(long userId) {  
 this.userId = userId;  
 }

LOAN

package com.hexaware.entities;  
  
import java.math.BigDecimal;  
import java.sql.Timestamp;  
  
public class Loan {  
 private long loanId;  
 private long customerId;  
 private String loanType;  
 private BigDecimal loanAmount;  
 private BigDecimal interestRate;  
 private int tenure;  
 private String purpose;  
 private String status;  
 private Timestamp applicationDate;  
 private Timestamp disbursementDate;  
 private Long employeeId;  
  
 public Loan() {  
 }  
  
 public long getLoanId() {  
 return loanId;  
 }  
  
 public void setLoanId(long loanId) {  
 this.loanId = loanId;  
 }  
  
 public long getCustomerId() {  
 return customerId;  
 }  
  
 public void setCustomerId(long customerId) {  
 this.customerId = customerId;  
 }  
  
 public String getLoanType() {  
 return loanType;  
 }  
  
 public void setLoanType(String loanType) {  
 this.loanType = loanType;  
 }  
  
 public BigDecimal getLoanAmount() {  
 return loanAmount;  
 }  
  
 public void setLoanAmount(BigDecimal loanAmount) {  
 this.loanAmount = loanAmount;  
 }  
  
 public BigDecimal getInterestRate() {  
 return interestRate;  
 }  
  
 public void setInterestRate(BigDecimal interestRate) {  
 this.interestRate = interestRate;  
 }  
  
 public int getTenure() {  
 return tenure;  
 }  
  
 public void setTenure(int tenure) {  
 this.tenure = tenure;  
 }  
  
 public String getPurpose() {  
 return purpose;  
 }  
  
 public void setPurpose(String purpose) {  
 this.purpose = purpose;  
 }  
  
 public String getStatus() {  
 return status;  
 }  
  
 public void setStatus(String status) {  
 this.status = status;  
 }  
  
 public Timestamp getApplicationDate() {  
 return applicationDate;  
 }  
  
 public void setApplicationDate(Timestamp applicationDate) {  
 this.applicationDate = applicationDate;  
 }  
  
 public Timestamp getDisbursementDate() {  
 return disbursementDate;  
 }  
  
 public void setDisbursementDate(Timestamp disbursementDate) {  
 this.disbursementDate = disbursementDate;  
 }  
  
 public Long getEmployeeId() {  
 return employeeId;  
 }  
  
 public void setEmployeeId(Long employeeId) {  
 this.employeeId = employeeId;  
 }  
  
 public static enum LoanStatus {  
 *Pending*, *Approved*, *Rejected*, *Disbursed*, *Repaid* }  
}

LOAN REPAYMENT

package com.hexaware.entities;  
  
import java.math.BigDecimal;  
import java.sql.Timestamp;  
  
public class LoanRepayment {  
 private long repaymentId;  
 private long loanId;  
 private BigDecimal amount;  
 private Timestamp repaymentDate;  
 private String status;  
  
 public LoanRepayment() {  
 }  
  
 public long getRepaymentId() {  
 return repaymentId;  
 }  
  
 public void setRepaymentId(long repaymentId) {  
 this.repaymentId = repaymentId;  
 }  
  
 public long getLoanId() {  
 return loanId;  
 }  
  
 public void setLoanId(long loanId) {  
 this.loanId = loanId;  
 }  
  
 public BigDecimal getAmount() {  
 return amount;  
 }  
  
 public void setAmount(BigDecimal amount) {  
 this.amount = amount;  
 }  
  
 public Timestamp getRepaymentDate() {  
 return repaymentDate;  
 }  
  
 public void setRepaymentDate(Timestamp repaymentDate) {  
 this.repaymentDate = repaymentDate;  
 }  
  
 public String getStatus() {  
 return status;  
 }  
  
 public void setStatus(String status) {  
 this.status = status;  
 }  
  
 public static enum RepaymentStatus {  
 *Completed*, *Pending*, *Failed* }  
}

TRANSACTION

package com.hexaware.entities;  
  
import java.math.BigDecimal;  
import java.sql.Timestamp;  
  
public class Transaction {  
 private long transactionId;  
 private long accountId;  
 private String transactionType;  
 private BigDecimal amount;  
 private Long destinationAccountId;  
 private Long beneficiaryId;  
 private Timestamp transactionDate;  
 private String status;  
 private String description;  
  
 public Transaction() {  
 }  
  
 public long getTransactionId() {  
 return transactionId;  
 }  
  
 public void setTransactionId(long transactionId) {  
 this.transactionId = transactionId;  
 }  
  
 public long getAccountId() {  
 return accountId;  
 }  
  
 public void setAccountId(long accountId) {  
 this.accountId = accountId;  
 }  
  
 public String getTransactionType() {  
 return transactionType;  
 }  
  
 public void setTransactionType(String transactionType) {  
 this.transactionType = transactionType;  
 }  
  
 public BigDecimal getAmount() {  
 return amount;  
 }  
  
 public void setAmount(BigDecimal amount) {  
 this.amount = amount;  
 }  
  
 public Long getDestinationAccountId() {  
 return destinationAccountId;  
 }  
  
 public void setDestinationAccountId(Long destinationAccountId) {  
 this.destinationAccountId = destinationAccountId;  
 }  
  
 public Long getBeneficiaryId() {  
 return beneficiaryId;  
 }  
  
 public void setBeneficiaryId(Long beneficiaryId) {  
 this.beneficiaryId = beneficiaryId;  
 }  
  
 public Timestamp getTransactionDate() {  
 return transactionDate;  
 }  
  
 public void setTransactionDate(Timestamp transactionDate) {  
 this.transactionDate = transactionDate;  
 }  
  
 public String getStatus() {  
 return status;  
 }  
  
 public void setStatus(String status) {  
 this.status = status;  
 }  
  
 public String getDescription() {  
 return description;  
 }  
  
 public void setDescription(String description) {  
 this.description = description;  
 }  
  
 public static enum TransactionType {  
 *Deposit*, *Withdrawal*, *Transfer* }  
  
 public static enum TransactionStatus {  
 *Completed*, *Pending*, *Failed* }  
}

USER

package com.hexaware.entities;  
  
public class User {  
 private long userId;  
 private String email;  
 private String password;  
 private String role;  
 private boolean isActive;  
  
 public User() {  
 this.isActive = true;  
 }  
  
 public long getUserId() {  
 return userId;  
 }  
  
 public void setUserId(long userId) {  
 this.userId = userId;  
 }  
  
 public String getEmail() {  
 return email;  
 }  
  
 public void setEmail(String email) {  
 this.email = email;  
 }  
  
 public String getPassword() {  
 return password;  
 }  
  
 public void setPassword(String password) {  
 this.password = password;  
 }  
  
 public String getRole() {  
 return role;  
 }  
  
 public void setRole(String role) {  
 this.role = role;  
 }  
  
 public boolean getIsActive() {  
 return isActive;  
 }  
  
 public void setIsActive(boolean isActive) {  
 this.isActive = isActive;  
 }  
  
 public static enum Role {  
 *CUSTOMER*, *EMPLOYEE*, *ADMIN* }  
}

**MYSQL DATABASE CREATION:**

create database BankSystem;

use BankSystem;

CREATE TABLE Customer (

customer\_id INT AUTO\_INCREMENT PRIMARY KEY,

name VARCHAR(100),

email VARCHAR(100) UNIQUE,

password VARCHAR(255),

contact\_number VARCHAR(15),

address TEXT,

date\_of\_birth DATE,

age INT,

aadhar\_number VARCHAR(12) UNIQUE,

pan\_number VARCHAR(10) UNIQUE,

created\_at DATETIME DEFAULT CURRENT\_TIMESTAMP,

updated\_at DATETIME DEFAULT CURRENT\_TIMESTAMP ON UPDATE CURRENT\_TIMESTAMP

);

CREATE TABLE Branch (

branch\_id INT AUTO\_INCREMENT PRIMARY KEY,

bank\_name VARCHAR(100),

branch\_name VARCHAR(100),

ifsc\_code VARCHAR(11) UNIQUE,

address TEXT,

created\_at DATETIME DEFAULT CURRENT\_TIMESTAMP

);

CREATE TABLE Account (

account\_id INT AUTO\_INCREMENT PRIMARY KEY,

customer\_id INT,

account\_type ENUM('Savings', 'Checking', 'Business'),

account\_number VARCHAR(20) UNIQUE,

ifsc\_code VARCHAR(11),

branch\_id INT,

balance DECIMAL(15,2),

status ENUM('Active', 'Pending', 'Closed'),

created\_at DATETIME DEFAULT CURRENT\_TIMESTAMP,

updated\_at DATETIME DEFAULT CURRENT\_TIMESTAMP ON UPDATE CURRENT\_TIMESTAMP,

FOREIGN KEY (customer\_id) REFERENCES Customers(customer\_id),

FOREIGN KEY (branch\_id) REFERENCES Branches(branch\_id)

);

CREATE TABLE Beneficiaries (

beneficiary\_id INT AUTO\_INCREMENT PRIMARY KEY,

customer\_id INT,

account\_name VARCHAR(100),

account\_number VARCHAR(20),

bank\_name VARCHAR(100),

branch\_name VARCHAR(100),

ifsc\_code VARCHAR(11),

created\_at DATETIME DEFAULT CURRENT\_TIMESTAMP,

FOREIGN KEY (customer\_id) REFERENCES Customers(customer\_id)

);

CREATE TABLE Transaction (

transaction\_id INT AUTO\_INCREMENT PRIMARY KEY,

account\_id INT,

transaction\_type ENUM('Deposit', 'Withdrawal', 'Transfer'),

amount DECIMAL(15,2),

destination\_account\_id INT NULL,

beneficiary\_id INT NULL,

transaction\_date DATETIME DEFAULT CURRENT\_TIMESTAMP,

status ENUM('Completed', 'Pending', 'Failed'),

description TEXT,

FOREIGN KEY (account\_id) REFERENCES Accounts(account\_id),

FOREIGN KEY (destination\_account\_id) REFERENCES Accounts(account\_id),

FOREIGN KEY (beneficiary\_id) REFERENCES Beneficiaries(beneficiary\_id)

);

CREATE TABLE Bank\_Employee (

employee\_id INT AUTO\_INCREMENT PRIMARY KEY,

name VARCHAR(100),

email VARCHAR(100) UNIQUE,

password VARCHAR(255),

role VARCHAR(50),

created\_at DATETIME DEFAULT CURRENT\_TIMESTAMP,

updated\_at DATETIME DEFAULT CURRENT\_TIMESTAMP ON UPDATE CURRENT\_TIMESTAMP

);

CREATE TABLE Loan (

loan\_id INT AUTO\_INCREMENT PRIMARY KEY,

customer\_id INT,

loan\_type VARCHAR(50),

loan\_amount DECIMAL(15,2),

interest\_rate DECIMAL(5,2),

tenure INT,

purpose TEXT,

status ENUM('Pending', 'Approved', 'Rejected', 'Disbursed', 'Repaid'),

application\_date DATETIME DEFAULT CURRENT\_TIMESTAMP,

disbursement\_date DATETIME NULL,

employee\_id INT NULL,

FOREIGN KEY (customer\_id) REFERENCES Customers(customer\_id),

FOREIGN KEY (employee\_id) REFERENCES Bank\_Employees(employee\_id)

);

CREATE TABLE Loan\_Repayment(

repayment\_id INT AUTO\_INCREMENT PRIMARY KEY,

loan\_id INT,

amount DECIMAL(15,2),

repayment\_date DATETIME DEFAULT CURRENT\_TIMESTAMP,

status ENUM('Completed', 'Pending', 'Failed'),

FOREIGN KEY (loan\_id) REFERENCES Loans(loan\_id)

);

CREATE TABLE Administrator (

admin\_id INT AUTO\_INCREMENT PRIMARY KEY,

name VARCHAR(100),

email VARCHAR(100) UNIQUE,

password VARCHAR(255),

created\_at DATETIME DEFAULT CURRENT\_TIMESTAMP,

updated\_at DATETIME DEFAULT CURRENT\_TIMESTAMP ON UPDATE CURRENT\_TIMESTAMP

);

describe loans;

CREATE TABLE user (

user\_id INT AUTO\_INCREMENT PRIMARY KEY,

email VARCHAR(100) UNIQUE NOT NULL,

password VARCHAR(255) NOT NULL,

role ENUM('CUSTOMER', 'EMPLOYEE', 'ADMIN') NOT NULL,

is\_active BOOLEAN DEFAULT TRUE

);