**DBMS PROJECT**

**ONLINE BANKING SYSTEM**

**

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**Problem Statement**

* To design a database and an application (part of the final evaluation) for an online banking system (like HDFC).

**Project Scope**

**ADMIN FEATURES (Employee or Branch Manager)**

* An employee is able to open new and verify different types of accounts of the users.
* An employee is able to add/remove money to accounts as a teller.
* An employee can start/end FD/RD for a user as per request.
* An employee can start and approve the loan applications of the user.
* An employee can apply/block a credit or debit card at the user's request.
* An employee can transfer money from one account to another on request.
* An employee can see translation logs to check the status of a transaction.
* An employee can authorize an advertisement for the bank.
* An employee can verify the documents submitted by the customers for accounting purposes.
* An employee can issue a passbook at the user’s request.

**USER FEATURES (Individual/Joint/Business)**

* A customer can apply for a new account by providing personal information.
* A customer can view the balance of his/her account.
* A customer can start/end an FD/RD from the portal whose money will be debited from the account.
* A customer can apply for personal/collateral loan from the portal.
* A customer can apply/block for a new credit card/ debit card from the portal.
* A customer can make bill payments and transfer money from one account to another (NEFT/RTGS/IMPS).
* A customer can apply for various types of insurance.
* A customer can make a passbook/checkbook request to a branch for his/her account.

**Assumptions**

* Our online banking system is a closed system where no transactions will happen with any other bank or with any other third party outside the scope of it.
* Investment-related accounts, plans, etc. things will be considered to be handled by some other banking service providers.
* Any document/photo in the database will be either stored in form of a file with a character string of some size in the respective field or by providing a link to it placed on the cloud.
* Any other banking-related services that are not listed on the ER diagram are considered to be managed by some other service providers, therefore, outside the scope of this project.

**Stakeholders**

Businesses, employees, customers, financial markets, and government.

**Entities**

**Branch (**IFSC\_Code, Branch\_Name, Street, City\_Village\_Town, District, State, Pincode, Opening\_Date**)**

**Bank\_Account (**Account\_Number, Date\_Of\_Opening, Min\_Balance\_Required, Account\_Balance, Interest\_Rate, Withdrawal\_Limit**)**

**Department (**Department\_ID, Department\_Name**)**

**Employee (**Employee\_ID, PAN\_Number, Aadhaar\_Number, First\_Name, Last\_Name, Apartment, Street, City\_Village\_Town, District, State, Pincode, DOB, Age(*Derived Attribute*), Employee\_Phone\_Number, Photo**)**

**Customer (**CIN, PAN\_Number, First\_Name, Last\_Name, Building, Street, City\_Village\_Town, District, State, {Phone\_Number}, Pincode**)**

**Collateral (**Collateral\_ID, Collateral\_Name, Collateral\_Value, {Documents\_Link}**)**

**Card (**Card\_Number, Linked\_Mobile\_Number, Card\_Pin, Issued\_Date, Expiry\_Date, CVV, Daily\_Limit, Monthly\_Limit**)**

**Loan (**Loan\_ID, Loan\_Amount, Interest\_Rate, Tenure\_Months, Loan\_Issued\_Date, Loan\_End\_Date(*Derived Attribute*), Loan\_Given\_To(*FK references Customer(CIN)*), EMI\_Amount**)**

**Insurance (**Policy\_ID, Policy\_Start\_Date, Policy\_Duration\_Years, Policy\_Expiry\_Date(*Derived Attribute*), Premium\_Amount, Sum\_Insured, Unclaimed\_Amount**)**

**Asset\_Insurance (**Policy\_ID(*FK references Insurance(Policy\_ID)*), Asset\_Document, Asset\_Value**)**

**Passbook (**Barcode, Date\_Issued, Date\_Last\_Printed**)**

**UPI (**UPI\_ID, Active\_Status, Last\_Used, Transaction\_Limit\_Remaining**)**

**UPI\_Transactions (**UPI\_Transaction\_ID, From\_UPI\_ID(*FK references UPI(UPI\_ID)*), To\_UPI\_ID(*FK references UPI(UPI\_ID)*), Transaction\_Date\_Time, Transaction\_Status, Transaction\_Amount**)**

**Bill\_Payment (**Bill\_ID**)**

**Auto\_Payment (**Auto\_Payment\_ID, Payment\_Date, Payment\_Frequency**)**

**Auto\_Payment\_Loan (**Auto\_Payment\_ID(*references Auto\_Payment(Auto\_Payment\_ID)*)**)**

**Auto\_Bill\_Payment (**Auto\_Payment\_ID(*references Auto\_Payment(Auto\_Payment\_ID)*)**)**

**Transaction\_Log (**Log\_ID, Log\_Date\_Time, Log\_File**)**

**Ad\_Channel (**Channel\_ID, Chanel\_Name, Channel\_Link**)**

**Advertisement (**Advertisement\_ID, Total\_Cost, Ad\_Type**)**

**User\_Credentials (**User\_Login\_ID, User\_Login\_Password**)**

**Employee\_Credentials (**Employee\_Login\_ID, Employee\_Login\_Password**)**

**Deposit (**Deposit\_ID, Start\_Date, Duration, Maturity\_Date(*Derived Attribute*), Interest\_Rate**)**

**Chequebook (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), MICR\_Code, Starting\_Cheque\_Number, Pages, Date\_Issued**)**

**Bank\_Statement (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), Info\_From\_Date, Info\_Till\_Date, Date\_Issued**)**

**OTPs (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), CIN(*FK references Customer(CIN)*), Valid\_From, Valid\_Till, OTP**)**

**Installment (**Installment\_ID, Transaction\_Date\_Time, Transaction\_Status, Transaction\_Amount, Transaction\_Type**)**

**Relationships with Attributes**

**Branch\_Account (**IFSC\_Code(*FK references Branch(IFSC\_Code)*), Branch\_Account\_Number(*FK references Bank\_Account(Account\_Number)*)**)**

**Account\_In\_Branch (**Branch\_Account\_Number(*FK references Bank\_Account(Account\_Number)*), IFSC\_Code(*FK references Branch(IFSC\_Code)*)**)**

**Employee\_Account (**Employee\_Account\_Number(*FK references Bank\_Account(Account\_Number)*), Employee\_ID(*references Employee(Employee\_ID))***)**

**Employee\_In\_Department (**Employee\_ID(*references Employee(Employee\_ID)),* Department(*FK references Department(Department\_ID)*)**)**

**Employee\_Works\_Branch (**Employee\_ID(*references Employee(Employee\_ID)),* IFSC\_Code(*FK references Branch(IFSC\_Code)*)**)**

**Branch\_Managed\_By** **(**IFSC\_Code(*FK references Branch(IFSC\_Code)*), Employee\_ID(*FK references Emlployee(Employee\_ID)*), Manages\_From, Manages\_Till**)**

**Collateral\_Owned\_By (**Collateral\_ID(*FK references Collateral(Collateral\_ID)*), Collateral\_Owner(*FK references Customer(CIN)*)**)**

**Personal\_Customer (**CIN(*FK references Customer(CIN)*), Aadhaar\_Number, DOB, Age(*Derived Attribute*), Photo**)**

**Business\_Customer (**CIN(*FK references Customer(CIN)*), GST, Business\_Name, Business\_Logo**)**

**Savings\_Account (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), CIN(*FK references Personal\_Customer(CIN)*)**)**

**Current\_Account (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), CIN(*FK references Business\_Customer(CIN)*), Maintenance\_Charges**)**

**Minor\_Account (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), Minor\_First\_Name, Minor\_Last\_Name, Parent\_Account\_Number(*FK references Savings\_Account(Account\_Number)*), Parent\_CIN(*FK references Personal\_Customer(CIN)*)**)**

**Zero\_Balance\_Account (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), CIN(*FK references Personal\_Customer(CIN)*)**)**

**Debit\_Card (**Card\_Number(*FK references Card(Card\_Number)*), Linked\_Account(*FK references Bank\_Account(Account\_Number)*)**)**

**Prepaid\_Card (**Card\_Number(*FK references Card(Card\_Number)*), CIN(*FK references Personal\_Customer(CIN)*), Prepaid\_Balance**)**

**ATM\_Card (**Card\_Number(*FK references Card(Card\_Number)*), Linked\_Account(*FK references Bank\_Account(Account\_Number)*), Cash\_Withdrawal\_Limit**)**

**Credit\_Card (**Card\_Number(*FK references Card(Card\_Number)*), CIN(*FK references Customer(CIN)*), Billing\_Date, Due\_Date(*Derived Attribute*), Credit\_Limit, Total\_Amount\_Due, Rewards\_Point, Minimum\_Amount\_Due(*Derived Attribute*)**)**

**Account\_Linked\_Credit\_Card (**Card\_Number(*FK references CreditCard(Card\_Number)*), Linked\_Account(*FK references Bank\_Account(Account\_Number)*)**)**

**Collateral\_Loan (**Loan\_ID(*FK references Loan(Loan\_ID)*), Collateral\_ID(*FK references Collateral(Collateral\_ID)*), Loan\_Type**)**

**Non\_Collateral\_Loan (**Loan\_ID(*FK references Loan(Loan\_ID)*), Loan\_Type, {Documents\_PDF}**)**

**Loan\_Account (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), Loan\_ID(*FK references Loan(Loan\_ID)*)**)**

**Insurance\_Given\_To (**Policy\_ID, Nominee\_ID(*FK references Customer(CIN)*)**)**

**Loan\_Protection\_Insurance (**Policy\_ID(*FK references Insurance(Policy\_ID)*), Loan\_ID(*FK references Loan(Loan\_ID)*)**)**

**Term\_Life\_Insurance (**Policy\_ID(*FK references Insurance(Policy\_ID)*), Insured\_Person(*FK references Personal\_Customer(CIN))***)**

**Medical\_Insurance (**Policy\_ID(*FK references Insurance(Policy\_ID)*), Insured\_Person(*FK references Personal\_Customer(CIN))***)**

**Transaction\_Details (**Transaction\_ID, From\_Account\_Number(*FK references Bank\_Account(Account\_Number)*), To\_Account\_Number(*FK references Bank\_Account(Account\_Number)*), Transaction\_Date\_Time, Transaction\_Status, Transaction\_Amount, Transaction\_Type**)**

**Passbook\_Account (**Barcode(*references Passbook(Barcode))*, Passbook\_Account\_Number(*FK references Bank\_Account(Account\_Number)*)**)**

**UPI\_Account (**UPI\_ID(*references UPI(UPI\_ID))*, Account\_Number\_Linked(*FK references Bank\_Account(Account\_Number)*)**)**

**Bill\_Payment\_Transactions (**Bill\_ID(*references Bill\_Payment(Bill\_ID))*, Transaction\_ID(*references Transaction\_Details(Transaction\_ID)*)**)**

**Card\_Transactions (**Transaction\_ID(*references Transaction\_Details(Transaction\_ID)*), From\_Card\_Number(*FK references Card(Card\_Number)*), To\_Card\_Number(*FK references Card(Card\_Number)*), Transaction\_Date\_Time, Transaction\_Status, Transaction\_Amount**)**

**Auto\_Debit\_Account (**Auto\_Payment\_ID(*references Auto\_Payment(Auto\_Payment\_ID)*, Autodebit\_Account\_Number(*FK references Bank\_Account(Account\_Number)*)**)**

**Auto\_Loan\_Account (**Auto\_Payment\_ID(*references Auto\_Payment\_Loan(Auto\_Payment\_ID)*, Linked\_Loan\_Account(*FK references Loan\_Account(Account\_Number)*)**)**

**Auto\_Bill\_To (**Auto\_Payment\_ID(*references Auto\_Bill\_Payment(Auto\_Payment\_ID)*, Bill\_ID(*references Bill\_payment(Bill\_ID)*)**)**

**Transaction\_With\_Log (**Log\_ID(*references* *Transaction\_Log(Log\_ID)*), Transaction\_ID(*references Transaction\_Details(Transaction\_ID)*)**)**

**Ad\_Channel\_By (**Advertisement\_ID(*references Advertisement(Advertisement\_ID))*, Channel\_ID(*references Ad\_Channel(Channel\_ID)*), Authorized\_By(*references Employee(Employee(ID)*)**)**

**Credentials\_Of\_User (**User\_Login\_ID(*references User\_Credentials(User\_Login\_ID)*), User\_ID(*references Customer(CIN)*)**)**

**Credentials\_Of\_Employee (**Employee\_Login\_ID(*references Employee\_Credentials(Employee\_Login\_ID)*), Employee\_ID(*references Employee(Employee\_ID)*)**)**

**Fixed\_Deposit (**Deposit\_ID(*FK references Deposit(Deposit\_ID)*), Account\_Number(*FK references Bank\_Account(Account\_Number)*), CIN(*FK references Personal\_Customer(CIN)*), Fixed\_Amount**)**

**Recurring\_Deposit (**Deposit\_ID(*FK references Deposit(Deposit\_ID)*), Account\_Number(*FK references Bank\_Account(Account\_Number)*), CIN(*FK references Personal\_Customer(CIN)*), Monthly\_Deposit\_Amount**)**

**Installment\_Of\_Loan (**Loan\_ID(*FK references Loan(Loan\_ID)*), Installment\_ID(*FK references Installment(Installment\_ID)*)**)**

**Relational Schemas**

**Database:** Online\_Banking\_System

**Branch (**IFSC\_Code, Branch\_Name, Branch\_Account\_Number(*FK references Bank\_Account(Account\_Number)*), Street, City\_Village\_Town, District, State, Pincode, Opening\_Date**)**

**Bank\_Account (**Account\_Number, Date\_Of\_Opening, Min\_Balance\_Required, Account\_Balance, IFSC\_Code(*FK references Branch(IFSC\_Code)*), Interest\_Rate, Withdrawal\_Limit**)**

**Department (**Department\_ID, Department\_Name**)**

**Employee (**Employee\_ID, PAN\_Number, Aadhaar\_Number, First\_Name, Last\_Name, Employee\_Account\_Number(*FK references Bank\_Account(Account\_Number)*), Department(*FK references Department(Department\_ID)*), Apartment, Street, City\_Village\_Town, District, State, Pincode, DOB, Age(*Derived Attribute*), Employee\_Phone\_Number, IFSC\_Code(*FK references Branch(IFSC\_Code)*), Photo**)**

**Branch\_Managed\_By** **(**IFSC\_Code(*FK references Branch(IFSC\_Code)*), Employee\_ID(*FK references Emlployee(Employee\_ID)*), Manages\_From, Manages\_Till**)**

**Customer (**CIN, PAN\_Number, First\_Name, Last\_Name, Building, Street, City\_Village\_Town, District, State, Pincode**)**

**Customer\_Phone\_Number (**CIN(*FK references Customer(CIN)*), Phone\_Number**)**

**Collateral (**Collateral\_ID, Collateral\_Name, Collateral\_Value, Collateral\_Owner(*FK references Customer(CIN)*)**)**

**Documents\_Link (**Document\_ID, Collateral\_ID(*FK references Collateral(Collateral\_ID)*), Document\_Link**)**

**Personal\_Customer (**CIN(*FK references Customer(CIN)*), Aadhaar\_Number, DOB, Age(*Derived Attribute*), Photo**)**

**Business\_Customer (**CIN(*FK references Customer(CIN)*), GST, Business\_Name, Business\_Logo**)**

**Savings\_Account (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), CIN(*FK references Personal\_Customer(CIN)*)**)**

**Current\_Account (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), CIN(*FK references Business\_Customer(CIN)*), Maintenance\_Charges**)**

**Minor\_Account (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), Minor\_First\_Name, Minor\_Last\_Name, Parent\_Account\_Number(*FK references Savings\_Account(Account\_Number)*), Parent\_CIN(*FK references Personal\_Customer(CIN)*)**)**

**Zero\_Balance\_Account (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), CIN(*FK references Personal\_Customer(CIN)*)**)**

**Card (**Card\_Number, Linked\_Mobile\_Number, Card\_Pin, Issued\_Date, Expiry\_Date, CVV, Daily\_Limit, Monthly\_Limit**)**

**Debit\_Card (**Card\_Number(*FK references Card(Card\_Number)*), Linked\_Account(*FK references Bank\_Account(Account\_Number)*)**)**

**Prepaid\_Card (**Card\_Number(*FK references Card(Card\_Number)*), CIN(*FK references Personal\_Customer(CIN)*), Prepaid\_Balance**)**

**ATM\_Card (**Card\_Number(*FK references Card(Card\_Number)*), Linked\_Account(*FK references Bank\_Account(Account\_Number)*), Cash\_Withdrawal\_Limit**)**

**Credit\_Card (**Card\_Number(*FK references Card(Card\_Number)*), CIN(*FK references Customer(CIN)*), Billing\_Date, Due\_Date(*Derived Attribute*), Credit\_Limit, Total\_Amount\_Due, Rewards\_Point, Minimum\_Amount\_Due(*Derived Attribute*)**)**

**Account\_Linked\_Credit\_Card (**Card\_Number(*FK references CreditCard(Card\_Number)*), Linked\_Account(*FK references Bank\_Account(Account\_Number)*)**)**

**Loan (**Loan\_ID, Loan\_Amount, Interest\_Rate, Tenure\_Months, Loan\_Issued\_Date, Loan\_End\_Date(*Derived Attribute*), Loan\_Given\_To(*FK references Customer(CIN)*), EMI\_Amount**)**

**Collateral\_Loan (**Loan\_ID(*FK references Loan(Loan\_ID)*), Collateral\_ID(*FK references Collateral(Collateral\_ID)*), Loan\_Type**)**

**Non\_Collateral\_Loan (**Loan\_ID(*FK references Loan(Loan\_ID)*), Loan\_Type**)**

**Documents\_PDF (**Document\_ID, Loan\_ID(*FK references Non\_Collateral\_Loan(Loan\_ID)*), Document\_PDF**)**

**Loan\_Account (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), Loan\_ID(*FK references Loan(Loan\_ID)*)**)**

**Insurance (**Policy\_ID, Policy\_Start\_Date, Policy\_Duration\_Years, Policy\_Expiry\_Date(*Derived Attribute*), Premium\_Amount, Sum\_Insured, Unclaimed\_Amount, Nominee\_ID(*FK references Customer(CIN)*)**)**

**Asset\_Insurance (**Policy\_ID(*FK references Insurance(Policy\_ID)*), Asset\_Document, Asset\_Value**)**

**Loan\_Protection\_Insurance (**Policy\_ID(*FK references Insurance(Policy\_ID)*), Loan\_ID(*FK references Loan(Loan\_ID)*)**)**

**Term\_Life\_Insurance (**Policy\_ID(*FK references Insurance(Policy\_ID)*), Insured\_Person(*FK references Personal\_Customer(CIN))***)**

**Medical\_Insurance (**Policy\_ID(*FK references Insurance(Policy\_ID)*), Insured\_Person(*FK references Personal\_Customer(CIN))***)**

**Transaction\_Details (**Transaction\_ID, From\_Account\_Number(*FK references Bank\_Account(Account\_Number)*), To\_Account\_Number(*FK references Bank\_Account(Account\_Number)*), Transaction\_Date\_Time, Transaction\_Status, Transaction\_Amount, Transaction\_Type**)**

**Passbook (**Barcode, Passbook\_Account\_Number(*FK references Bank\_Account(Account\_Number)*), Date\_Issued, Date\_Last\_Printed**)**

**UPI (**UPI\_ID, Account\_Number\_Linked(*FK references Bank\_Account(Account\_Number)*), Active\_Status, Last\_Used, Transaction\_Limit\_Remaining**)**

**UPI\_Transactions (**UPI\_Transaction\_ID, From\_UPI\_ID(*FK references UPI(UPI\_ID)*), To\_UPI\_ID(*FK references UPI(UPI\_ID)*), Transaction\_Date\_Time, Transaction\_Status, Transaction\_Amount**)**

**Bill\_Payment (**Bill\_ID, Transaction\_ID(*references Transaction\_Details(Transaction\_ID)*)**)**

**Card\_Transactions (**Transaction\_ID(*references Transaction\_Details(Transaction\_ID)*), From\_Card\_Number(*FK references Card(Card\_Number)*), To\_Card\_Number(*FK references Card(Card\_Number)*), Transaction\_Date\_Time, Transaction\_Status, Transaction\_Amount**)**

**Auto\_Payment (**Auto\_Payment\_ID, Payment\_Date, Payment\_Frequency, Autodebit\_Account\_Number(*FK references Bank\_Account(Account\_Number)*)**)**

**Auto\_Payment\_Loan (**Auto\_Payment\_ID(*references Auto\_Payment(Auto\_Payment\_ID)*), Linked\_Loan\_Account(*FK references Loan\_Account(Account\_Number)*)**)**

**Auto\_Bill\_Payment (**Auto\_Payment\_ID(*references Auto\_Payment(Auto\_Payment\_ID)*), Bill\_ID(*references Bill\_payment(Bill\_ID)*)**)**

**Transaction\_Log (**Log\_ID, Log\_Date\_Time, Transaction\_ID(*references Transaction\_Details(Transaction\_ID)*), Log\_File**)**

**Ad\_Channel (**Channel\_ID, Chanel\_Name, Channel\_Link**)**

**Advertisement (**Advertisement\_ID, Total\_Cost, Ad\_Type, Channel\_ID(*references Ad\_Channel(Channel\_ID)*), Authorized\_By(*references Employee(Employee(ID)*)**)**

**User\_Credentials (**User\_Login\_ID, User\_Login\_Password, User\_ID(*references Customer(CIN)*)**)**

**Employee\_Credentials (**Employee\_Login\_ID, Employee\_Login\_Password, Employee\_ID(*references Employee(Employee\_ID)*)**)**

**Fixed\_Deposit (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), CIN(*FK references Personal\_Customer(CIN)*), Fixed\_Amount, Start\_Date, Duration, Maturity\_Date(*Derived Attribute*), Interest\_Rate**)**

**Recurring\_Deposit (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), CIN(*FK references Personal\_Customer(CIN)*), Monthly\_Deposit\_Amount, Start\_Date, Duration, Maturity\_Date(*Derived Attribute*), Interest\_Rate**)**

**Chequebook (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), MICR\_Code(*Derived Attribute*), Starting\_Cheque\_Number, Pages, Date\_Issued**)**

**Bank\_Statement (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), Info\_From\_Date, Info\_Till\_Date, Date\_Issued**)**

**OTPs (**Account\_Number(*FK references Bank\_Account(Account\_Number)*), CIN(*FK references Customer(CIN)*), Valid\_From, Valid\_Till, OTP**)**

**Installment (**Loan\_ID(*FK references Loan(Loan\_ID)*), Transaction\_Date\_Time, Transaction\_Status, Transaction\_Amount, Transaction\_Type**)**

**Weak Entity**

* **Transaction\_Details (**Transaction\_ID, From\_Account\_Number(*FK references Bank\_Account(Account\_Number)*), To\_Account\_Number(*FK references Bank\_Account(Account\_Number)*), Transaction\_Date\_Time, Transaction\_Status, Transaction\_Amount, Transaction\_Type**)**
  + *Dependent on* ***Bank\_Account*** *entity since transactions happen between the accounts*
* **UPI\_Transactions (**UPI\_Transaction\_ID, From\_UPI\_ID(*FK references UPI(UPI\_ID)*), To\_UPI\_ID(*FK references UPI(UPI\_ID)*), Transaction\_Date\_Time, Transaction\_Status, Transaction\_Amount**)**
  + *Dependent on* ***UPI*** *entity since UPI transactions happen from one UPI id to another*

**Ternary Relationship**

* **Ad\_Channel\_By (**Advertisement\_ID(*references Advertisement(Advertisement\_ID))*, Channel\_ID(*references Ad\_Channel(Channel\_ID)*), Authorized\_By(*references Employee(Employee(ID)*)**)**
  + *Relationship between* ***Advertisement****,* ***Ad\_Channel****, and* ***Employee*** *since each ad is released on only one channel and authorized by only one employee*

**SQL Queries**

**-- Query 1 [select, order by asc/desc]**

SELECT IFSC\_Code, Branch\_Name, District, State

FROM Branch

ORDER BY State ASC, Branch\_Name DESC;

**-- Query 2 [insert]**

INSERT INTO Branch\_Managed\_By

VALUES (100014, 10026, '2027-11-12', '2030-11-12');

SELECT \* FROM Branch\_Managed\_By;

-- DELETE FROM Branch\_managed\_By WHERE Employee\_Id = 10026;

**-- Query 3 [update]**

UPDATE Employee

SET Department = 1

WHERE Employee\_ID = 10026;

SELECT \* FROM Employee;

**-- Query 4 [delete]**

DELETE FROM Customer\_Phone\_Number

WHERE CIN = 100000400;

-- INSERT INTO Customer\_Phone\_Number

-- VALUES (100000400, 6679930452);

SELECT \* FROM Customer\_Phone\_Number;

**-- Query 5 [sum, if\_null]**

SELECT COALESCE(SUM(Collateral\_Value), 0)

AS Total\_Collateral\_Value

FROM Collateral;

**-- Query 6 [case when then else]**

SELECT Account\_Number,

CASE

WHEN Account\_Balance > 500000 THEN 'The balance is greater than 5 lakhs'

WHEN Account\_Balance > 100000 THEN 'The balance is between 1 to 5 lakhs'

ELSE 'The balance is under 1 lakh'

END AS Balance

FROM Bank\_Account;

**-- Query 7 [exists]**

SELECT Card\_Number, Linked\_Mobile\_Number

FROM Card

WHERE EXISTS (SELECT \* FROM Debit\_Card WHERE Debit\_Card.Card\_Number = Card.Card\_Number);

**-- Query 8 [like]**

SELECT \* FROM Customer

WHERE City\_Village\_Town LIKE '%\_pur';

**-- Query 9 [between, and]**

SELECT \* FROM Transaction\_Details

WHERE Transaction\_Status = 'success' AND Transaction\_Date\_Time BETWEEN '2022-01-01 00:00:00' AND '2022-02-01 00:00:00';

**-- Query 10 [count, group by, having]**

SELECT COUNT(Account\_Number) , Min\_Balance\_Required

FROM Bank\_Account

GROUP BY Min\_Balance\_Required

Having COUNT(Account\_Number)>100;

**-- Query 11 [join]**

SELECT Account\_Number, Card\_Number, Cash\_Withdrawl\_Limit

FROM Bank\_Account INNER JOIN ATM\_Card ON Account\_Number = Linked\_Account

WHERE Account\_Number = '11000000120';

**-- Query 12 [alter table]**

ALTER TABLE Employee

ADD CONSTRAINT chk\_age CHECK (Age>=18);

-- ALTER TABLE Employee

-- DROP CONSTRAINT chk\_age;

SELECT \* FROM Employee;

**-- Query 13 [create view]**

CREATE VIEW JalandharCustomer AS

SELECT \*

FROM Customer

WHERE City\_Village\_Town = 'Jalandhar';

SELECT \* FROM JalandharCustomer;

**-- Query 14 [authorization]**

CREATE USER IF NOT EXISTS 'ars'@'localhost'

IDENTIFIED BY 'ars';

GRANT INSERT

ON online\_banking\_system.advertisement

TO 'ars'@'localhost';

SHOW GRANTS FOR 'ars'@'localhost';

REVOKE INSERT

ON online\_banking\_system.advertisement

FROM 'ars'@'localhost';

DROP USER IF EXISTS 'ars'@'localhost';