

Banking System Database

Group number - 14

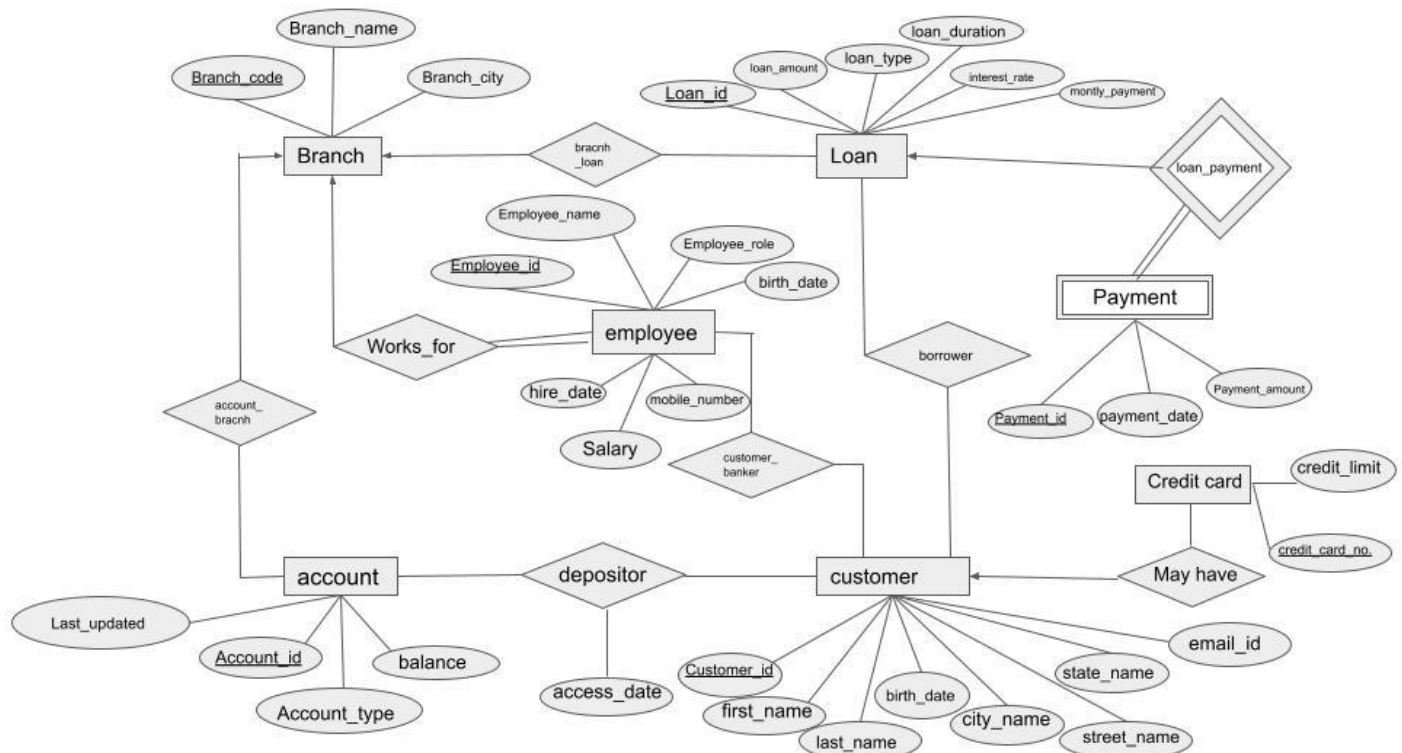
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ER DIAGRAM :



Functionality:

The bank is organised into various branches. Each **branch** is located in a particular city and has a unique name. Each branch has a particular branch code.

The **customers** of the bank are uniquely identified by their customer id values. The bank has information about each **customer's name, street** and **city** where the customer lives. Customers may have **accounts** and they may take **loans**. A customer may be associated with a particular bank **employee**.

Employees of the bank are identified by employee id values. The bank has information like the **name of the employee, telephone number, names of the employees 's dependent, role of the employee in the bank**. Each employee works for a particular bank and each branch may have many employees. The bank also keeps track of the *employee's hire date* and we can get employment *experience* for the employee.

Bank offers accounts to the customers. Accounts can be held by more than one customer and one customer can have more than one account. Each account has a unique account number and the

bank maintains information about the record of the account's balance and the recent date on which the account was accessed by the customer holding the account.

A loan originates at a particular branch and can be held by one or more customers. A loan has a unique loan number. For each loan, the bank has information about the loan amount and the loan payments. Although a loan payment does not uniquely identify a particular payment among those for all the bank's loans, a payment number will identify a particular payment for a specific loan.

The date and amount are noted for each payment. A customer may have a **credit card** offered by the bank.

Cardinality Constraints:

A customer can have multiple accounts and an account can be held by multiple customers.

Cardinality is M:N.

Customers are allowed to take loans from the bank and a loan can be held by one or more customers. Cardinality is M:N.

Each loan can be paid back with multiple payments having payment numbers. Cardinality is 1:N.

A customer can be an employee of a bank. Cardinality is M:N.

Branch can have multiple accounts. Cardinality is 1:N.

A branch of the bank will give loans to the customers. Cardinality is 1:N.

A customer may have multiple credit cards. Cardinality is 1:N.

The entities and attributes for the entities are as follows:

ENTITY	ATTRIBUTES
Branch	<u>Branch_code</u> , Branch_name,Branch_city
Customer	<u>Customer_id</u> , first_name, last_name, birth_date, city_name, street_name, state_name, email_id
loan	<u>Loan_id</u> , loan_amount, loan_type, loan_duration, interest_rate, monthly_payment
Employee	<u>Employee_id</u> , Employee_name, mobile_number, Employee_role, birth_date, hire_date, Salary
Payment	<u>Payment_id</u> , payment_date, Payment_amount
Account	<u>Account_id</u> , balance, Account_type, Last_update
Credit card	<u>credit_card_no.</u> ,credit_limit

ER DIAGRAM TO RELATIONAL MODEL:

Entity Tables:

BRANCH

<u>Branch_code</u>	Branch_name	Branch_city
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CUSTOMER

<u>Customer_id</u>	First_name	last_name	Birth_date	city_name	street_name	state_name	email_id
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LOAN

<u>Loan_id</u>	Loan_amount	Loan_type	Loan_duration	Interest_rate	Monthly_payment	Branch_code
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EMPLOYEE

<u>Employee_id</u>	Employee_name	Mobile_number	Employee_role	Birth_date	Hire_date	Salary	Branch_code
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PAYMENT

<u>Payment_id</u>	Payment_date	Payment_amount	Loan_id
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ACCOUNT

<u>Account_id</u>	Balance	Account_type	Last_update	Branch_code
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CREDIT_CARD

<u>Credit_card_number</u>	Credit_limit	customer_id
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Relationship Tables:

DEPOSITOR

<u>Customer_id</u>	<u>Account_id</u>	Access_date
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BORROWER

<u>Customer_id</u>	<u>Loan_id</u>
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CUSTOMER_BANKER

<u>Employee_id</u>	<u>Customer_id</u>
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Constraints:

- Branch:
Branch_code - PRIMARY KEY
Branch_name - UNIQUE
Branch_city - NOT NULL
- Loan:
Loan_id - PRIMARY KEY
Loan_amount - CHECK(loan_amount > 0)
Loan_type - NOT NULL
Loan_duration_months - NOT NULL
Interest_rate - NOT NULL
Monthly_payment - CHECK(monthly_payment > 0)
Branch_code - FOREIGN KEY
- Customer:
Customer_id - PRIMARY KEY
First_name - NOT NULL
Last_name - NOT NULL
Birth_date - NOT NULL
Street_name - NOT NULL
City_name - NOT NULL
State_name - NOT NULL
Email_id - NOT NULL
- Employee:
Employee_id - PRIMARY KEY
Employee_name - UNIQUE
Employee_role - NOT NULL
Salary - CHECK(salary > 0)
Telephone_number - UNIQUE
Birth_date - NOT NULL
Hire_date - NOT NULL
Branch_code - FOREIGN KEY
- Payment:
Payment_id - PRIMARY KEY
Payment_amount - NOT NULL
Payment_date - NOT NULL

Loan_id - FOREIGN KEY

- Account:
Account_id - PRIMARY KEY
Account_type - NOT NULL
Balance - NOT NULL
Last_updated - DEFAULT current_timestamp NOT NULL
Branch_code - FOREIGN KEY
- Credit_card:
Credit_card_number - PRIMARY KEY
Credit_limit - NOT NULL
Customer_id - FOREIGN KEY
- Depositor:
Customer_id - PRIMARY KEY, FOREIGN KEY
Account_id - FOREIGN KEY, UNIQUE
Access_date - NOT NULL
- Borrower:
Customer_id - PRIMARY KEY, FOREIGN KEY
Loan_id - FOREIGN KEY, UNIQUE
- Customer_banker:
Employee_id - PRIMARY KEY, FOREIGN KEY
Customer_id - FOREIGN KEY , UNIQUE

TABLES WITH DATA:








1. Branch

	Data Output	Explain	Messages	Notifications
	branch_code [PK] character varying (10)	branch_name text	branch_city text	
1	HYD0001	Vidyanagar Branch	Hyderabad	
2	WAR0025	Rajaj Nagar Colony Branch	Warangal	
3	MED0155	Rajendra Nagar Branch	Medak	
4	NAL0085	Market road Branch	Nalgonda	
5	NIZ0109	Ayodhya Nagar Branch	Nizambad	
6	KAR0045	Mahathma Nagar Branch	Karimnagar	

2. Loan

Data Output		Explain	Messages	Notifications			
	 loan_id [PK] integer	 loan_amount numeric (10,2)	 loan_type character varying (30)	 loan_duration_months integer	 interest_rate numeric (4,2)	 monthly_payment numeric (10,2)	 branch_code character varying (10)
1	1200102	200000.00	Equipment loan	12	0.03	20000.00	HYD0001
2	1200106	1000000.00	House loan	60	0.06	20000.00	HYD0001
3	1200108	2000000.00	Business loan	30	0.07	70000.00	HYD0001
4	1200109	2000000.00	House loan	32	0.04	62500.00	WAR0025
5	1200112	350000.00	Personal_loam	20	0.06	17500.00	MED0155
6	1200115	600000.00	House loan	10	0.07	60000.00	NIZ0109
7	1200119	5000000.00	Mortage loan	32	0.08	156250.00	HYD0001
8	1200120	1500000.00	Business loan	20	0.05	75000.00	KAR0045
9	1200124	1000000.00	House loan	40	0.04	25000.00	NAL0085
10	1200126	550000.00	Car loan	16	0.02	34380.00	HYD0001






3. Customer

	Data Output	Explain	Messages	Notifications					
	 customer_id [PK] integer	 first_name character varying (30)	 last_name character varying (30)	 birth_date date	 street_name character varying (20)	 city_name character varying (20)	 state_name character varying (25)	email_id character varying (30)	
1	101	Kiran	Kumar	1988-05-12	Vidyanagar	Hyderabad	Telangana	kirankumar@gmail.com	
2	102	Rahul	Mehta	1990-09-02	Kukatpally	Hyderabad	Telangana	rahulmehta02@gmail.com	
3	103	Nandan	Mohan	1984-12-09	Jublie Hills	Hyderabad	Telangana	nandanmohan1984@gmail.com	
4	104	Lakshana	kolur	1998-05-15	Rajaj Nagar Colony	Warangal	Telangana	lakshanakolour@gmail.com	
5	105	Mohan	Kumar	1988-05-15	Rajendra Nagar	Medak	Telangana	mohankumar1505@gmail.com	
6	106	Meghana	Singh	1996-06-12	Ayodhya Nagar	Nizambad	Telangana	meghanasingh1996@gmail.com	
7	107	Ranjdeep	Mamtani	1965-06-19	Uppal	Hyderabad	Telangana	rajdeepmamtani06@gmail.com	
8	108	Sonal	Singh	1989-12-02	Mahathma Nagar	Karimnagar	Telangana	sonalsingh@gmail.com	
9	109	Abhilasha	Somani	1977-05-01	Market road	Nalgonda	Telangana	abhilashasomani007@gmail.com	
10	110	Jayashree	Kumari	1990-11-12	Mehedipatnam	Hyderabad	Telangana	jayashreekumari1211@gmail.com	

4. Employee

Data Output		Explain	Messages	Notifications				
	employee_id [PK] integer	employee_name character varying (30)	employee_role character varying (30)	salary numeric (10,2)	telephone_number character varying (10)	birth_date date	hire_date date	branch_code character varying (20)
1	1101	Kiran Kumar	Manager	60000.00	9874563210	1988-05-12	2014-08-...	HYD0001
2	1102	Rahul Mehta	Officer	40000.00	9745612309	1990-09-02	2016-05-...	HYD0001
3	1103	Lakshana Kolor	Officer	50000.00	9654321098	1998-05-15	2019-10-...	WAR0025
4	1104	Mohan Kumar	Manager	80000.00	9543210987	1988-05-15	2012-05-...	MED0155
5	1105	Abhilasha Somani	Officer	45000.00	9432109876	1977-05-01	2002-09-...	NAL0085
6	1106	Amol Srivatsava	Manager	70000.00	9321098765	1982-04-16	2015-01-...	NAL0085
7	1107	Mrinal Kumar	Officer	35000.00	9210987654	1996-02-16	2018-03-...	NIZ0109
8	1108	Najuk Pincha	Officer	40000.00	9109876543	1972-04-02	2000-09-...	KAR0045
9	1109	Radhika Agarwal	Manager	75000.00	9098765432	1985-08-13	2009-07-...	WAR0025
10	1110	Debojit Agarwal	officer	38000.00	9012345678	1991-12-01	2013-05-...	HYD0001




5. Payment

	Data Output	Explain	Messages	Notifications
	 payment_id [PK] integer 	payment_amount numeric (10,2) 	payment_date date 	loan_id integer 
1	1210	20000.00	2022-03-02	1200102
2	1211	20000.00	2022-02-16	1200106
3	1212	70000.00	2022-03-12	1200108
4	1213	62500.00	2022-02-01	1200109
5	1214	17500.00	2022-03-10	1200112
6	1215	60000.00	2022-01-29	1200115
7	1216	156250.00	2022-03-02	1200119
8	1217	75000.00	2022-02-26	1200120
9	1218	25000.00	2022-03-11	1200124
10	1219	34380.00	2022-03-13	1200126




6. Account

Data Output		Explain	Messages	Notifications	
	account_id [PK] character varying (10)	account_type character varying (20)	balance numeric (10,2)	last_updated timestamp without time zone	branch_code character varying (10)
1	3982276530	Chekcing Account	5000.00	2022-03-13 20:24:59.233702	HYD0001
2	8902345125	Savings Account	60000.00	2022-03-13 20:24:59.233702	HYD0001
3	9871702287	Savings Account	70000.00	2022-03-13 20:24:59.233702	HYD0001
4	4345010261	Zero Balance Account	7000.00	2022-03-13 20:24:59.233702	WAR0025
5	9124003568	Cheking Account	6500.00	2022-03-13 20:24:59.233702	MED0155
6	5189201392	Savings Account	45000.00	2022-03-13 20:24:59.233702	NIZ0109
7	8001939743	Checking Account	5000.00	2022-03-13 20:24:59.233702	HYD0001
8	6829743045	Savings Account	80000.00	2022-03-13 20:24:59.233702	KAR0045
9	8028492955	Checking Account	10000.00	2022-03-13 20:24:59.233702	NAL0085
10	8027649295	Checking Account	9000.00	2022-03-13 20:24:59.233702	HYD0001
11	8175492955	Zero Balance Account	4000.00	2022-03-13 20:24:59.233702	MED0155
12	8028406355	Zero Balance Account	6000.00	2022-03-13 20:24:59.233702	HYD0001

7. Credit Card

	Data Output	Explain	Messages	Notifications
	credit_card_number [PK] character varying (20) 	credit_limit numeric (10,2) 	customer_id integer 	
1	3714496353984371	30000.00	101	
2	3643893643893654	20000.00	103	
3	6011016011016011	10000.00	104	
4	3611036110361276	35000.00	106	
5	3611064749361281	20000.00	108	
6	4562036780362678	20000.00	110	




8. Depositor

	Data Output	Explain	Messages	Notifications
	customer_id [PK] integer 	account_id character varying (10) 	access_date date 	
1	101	3982276530	2022-03-03	
2	102	8902345125	2022-02-17	
3	103	9871702287	2022-03-13	
4	104	4345010261	2022-02-02	
5	105	9124003568	2022-03-11	
6	106	5189201392	2022-01-30	
7	107	8001939743	2022-03-03	
8	108	6829743045	2022-02-27	
9	109	8028492955	2022-03-12	
10	110	8027649295	2022-03-12	

9. Borrower

Data Output		Explain	Message
	customer_id [PK] integer 	loan_id integer 	
1	101	1200102	
2	102	1200106	
3	103	1200108	
4	104	1200109	
5	105	1200112	
6	106	1200115	
7	107	1200119	
8	108	1200120	
9	109	1200124	
10	110	1200126	

10. Customer_Banker

Data Output		Explain	Messages
	 employee_id [PK] integer 	customer_id integer 	
1	1101	101	
2	1102	102	
3	1103	104	
4	1104	105	
5	1105	109	

There are mainly three types of roles in this database:

1. Manager: This role has all access to the database created.
2. Officer: As this role is an employee in a bank the main job is to edit the data. So this role has access to INSERT, UPDATE and DELETE operations commands created in the database
3. Customer: This role only can use the SELECT command.

