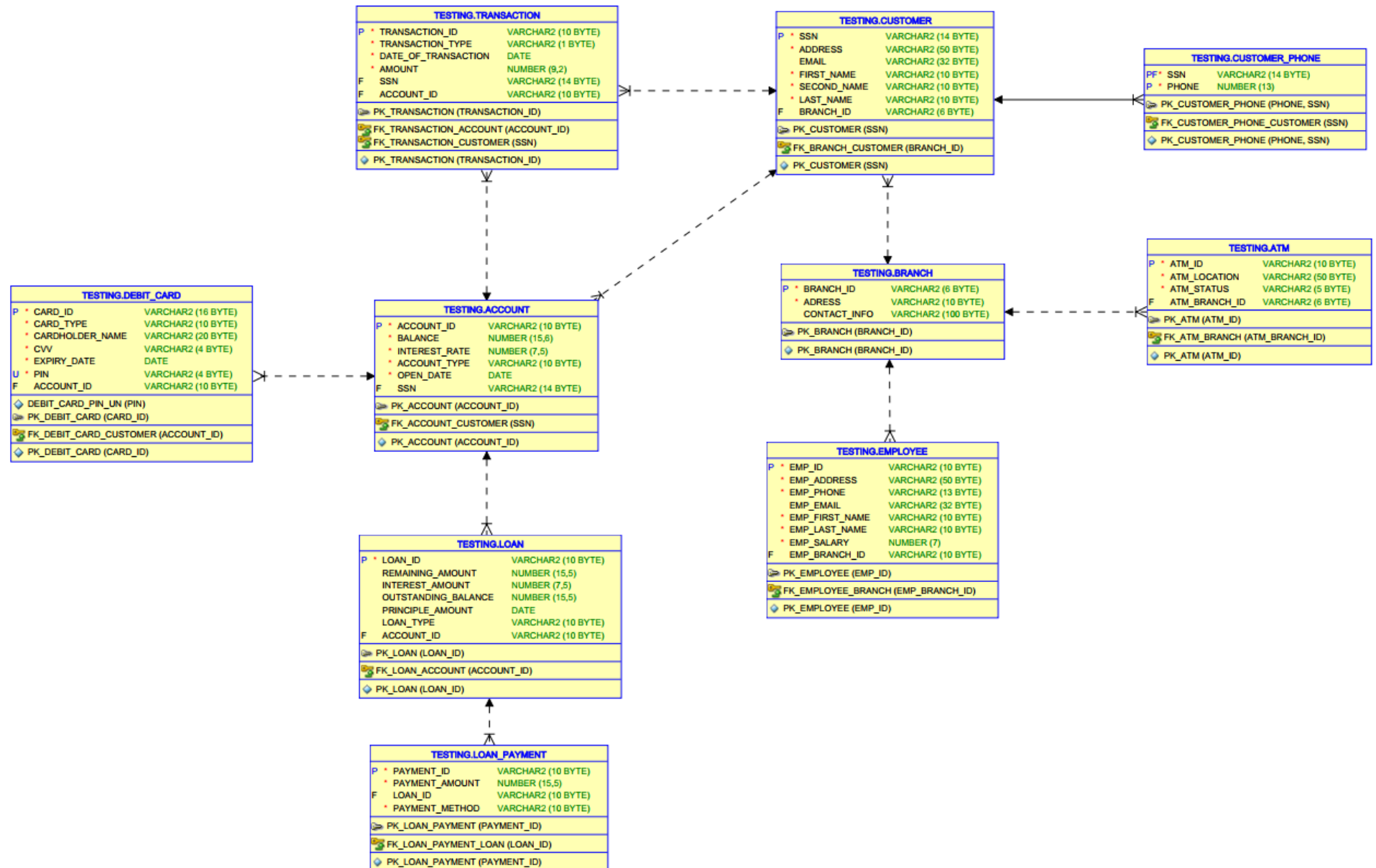


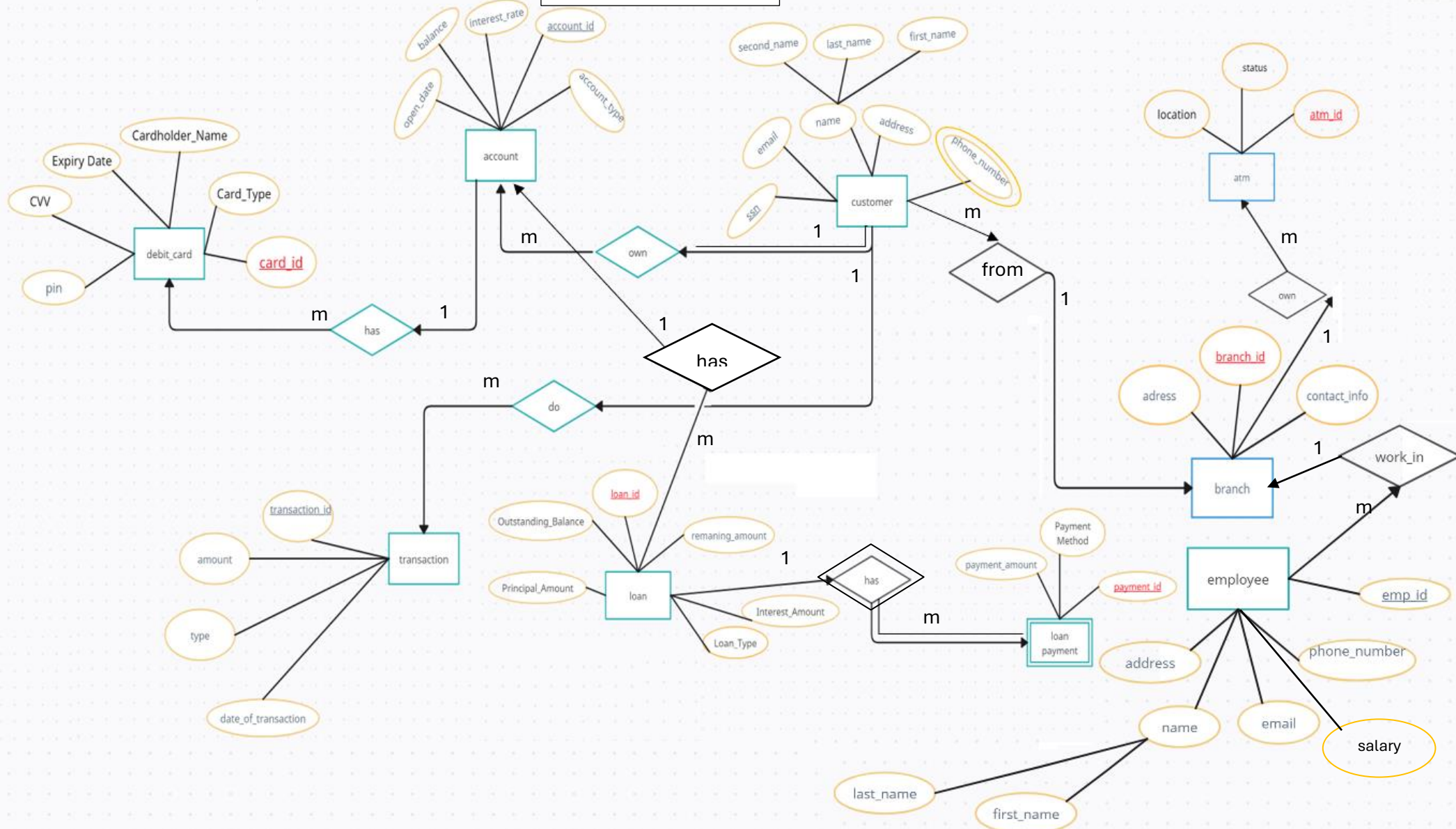
TITLE: Banking Database System

DATABASE OBJECTIVES:

1. **Employee Management:** The database should store comprehensive details about bank employees, including personal information, roles, and assignments. It should support efficient employee management, training, and performance evaluation.
2. **Customer Management (CRM):** The system should maintain a detailed repository of customer information, including personal data, contact details, and account associations. It should facilitate seamless customer onboarding, account management, and communication channels.
3. **Account Management:** The database must support various types of bank accounts, including savings, checking, and investment accounts. It should enable account creation, modification, and closure, while ensuring accurate tracking of balances, transactions, and associated services.
4. **Branch Operations:** The system should have multiple location.
5. **ATM Management:** The database should manage ATM deployments, configurations, and maintenance schedules. It should track ATM locations, transactions, and operational statuses to ensure uninterrupted service delivery.
6. **Debit Card Management:** The system should maintain records of issued debit cards, including cardholder details, card types, and associated accounts. It should support card activation, deactivation, and replacement procedures while ensuring transaction security and compliance with payment regulations.
7. **Loan Management:** The database must handle the bank's loan portfolio, including loan applications, approvals, disbursements, and repayments. It should calculate interest rates, installment amounts, and repayment schedules accurately while monitoring loan statuses and collateral.
8. **Loan Payment Tracking:** The system should track individual loan payments, including payment dates, amounts, and allocation to principal and interest. It should maintain a comprehensive payment history for each loan account, facilitating accurate balance calculations and financial reporting.
9. **Transaction Processing:** The database must process various types of transactions, including deposits, withdrawals, transfers, and payments. It should ensure real-time transaction processing, data integrity, and auditability to support accurate account balances and regulatory compliance



ERD



RELATION DIAGRAM

CUSTOMER

<u>ssn</u>	email	address	First_name	Second_name	Last_name	Branch_id
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CUSTOMER_PHONE

<u>ssn</u>	phone
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ACCOUNT

<u>account_id</u>	account_type	balance	Interest_rate	Open_date	<u>ssn</u>
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DEBIT_CARD

<u>card_id</u>	Card_type	cvv	pin	Cardholder_name	Expiry_date	Account_id
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LOAN

<u>Loan_id</u>	Remaining_amount	Interest_amount	Outstanding_balance	Principle_amount	Loan_type	Account_id
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LOAN_PAYMENT

<u>Payment_id</u>	<u>Loan_id</u>	Payment_amount	Payment_method
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TRANSACTION

<u>Transaction_id</u>	amount	type	Date_of_transaction	<u>ssn</u>	Account_id
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BRANCH

<u>branch_id</u>	address	Contact_info
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ATM

<u>atm_id</u>	location	status	Branch_id
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EMPLOYEE

<u>emp_id</u>	first_name	last_name	address	email	salary	phone	branch_id
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Relation Name: CUSTOMER

Number Of Attributes: 7

Record Size:

Expected Number Of Records:

No.	Attribute Name	Data Type	Description	PK	FK	Reference
1	ssn	VARCHAR2(14)	Customer Social Security Number, only numbers	✓		
2	address	VARCHAR2(50)	NOT NULL ,format:- country-gov-city-district-street			
3	email	VARCHAR2(32)				
4	first_name	VARCHAR2(10)	NOT NULL			
5	second_name	VARCHAR2(10)	NOT NULL			
6	last_name	VARCHAR2(10)	NOT NULL			
7	Branch_id	VARCHAR2(6)			✓	BRANCH

Relation Name: ACCOUNT

Number Of Attributes: 6

Record Size:

Expected Number Of Records:

No.	Attribute Name	Data Type	Description	PK	FK	Reference
1.	<u>account_id</u>	VARCHAR2(10)	only numbers	✓		
2.	balance	NUMERIC (15, 6)	NOT NULL			
3.	interest_rate	NUMERIC (7, 5)	NOT NULL			
4	account_type	VARCHAR2(10)	NOT NULL			
5	open_date	DATE	NOT NULL			
6	ssn	VARCHAR2(14)	Customer Social Security Number, only numbers		✓	CUSTOMER

Relation Name: CUSTOMER_PHONE

Number Of Attributes: 2

Record Size:

Expected Number Of Records:

No.	Attribute Name	Data Type	Description	PK	FK	Reference
1.	ssn	VARCHAR2(14)	Customer Social Security Number, only numbers	✓	✓	CUSTOMER
2.	phone	NUMERIC (13, 0)	only numbers, not null	✓		

Relation Name: DEBIT_CARD

Number Of Attributes: 7

Record Size:

Expected Number Of Records:

No.	Attribute Name	Data Type	Description	PK	FK	Reference
1.	card_id	VARCHAR2(16)	only numbers	✓		
2.	Card_type	VARCHAR2(10)				
3	Cardholder_name	VARCHAR2(20)	First and last name			
4	cvv	VARCHAR2(4)	four-digit number printed on the back			
5	expiry_date	DATE				
6	pin	VARCHAR2(4)	Personal Identification Number, only numbers, not null			
7	account_id	VARCHAR2(10)			✓	ACCOUNT

Relation Name: TRANSACTION

Number Of Attributes: 6

Record Size:

Expected Number Of Records:

No.	Attribute Name	Data Type	Description	PK	FK	Reference
1.	Transaction_id	VARCHAR2(10)	only numbers	✓		
2.	Transaction_type	VARCHAR2(1)	NOT NULL,0 correspond to withdrawal, 1 correspond to deposit, not null			
3.	Date_of_transaction	DATE	NOT NULL			
4.	amount	NUMERIC (9, 2)	NOT NULL			
5.	ssn	VARCHAR2(14)	Customer Social Security Number, only numbers		✓	CUSTOMER
6.	account_id	VARCHAR2(10)			✓	ACCOUNT

Relation Name: LOAN

Number Of Attributes: 7

Record Size:

Expected Number Of Records:

No.	Attribute Name	Data Type	Description	PK	FK	Reference
1.	<u>Loan_id</u>	VARCHAR2(10)	only numbers	✓		
2.	Remaining_amount	NUMERIC(15,5)				
3	Interest_amount	NUMERIC (7, 5)				
4	Outstanding_balance	NUMERIC(15,5)				
5	Principle_amount	NUMERIC(15,5)	the initial loan amount that is disbursed to the borrower by the lender			
6	Loan_type	VARCHAR2(10)	Auto Loan, Personal Loan,home loan			
7	account_id	VARCHAR2(10)			✓	ACCOUNT

Relation Name: LOAN_PAYMENT

Number Of Attributes: 4

Record Size:

Expected Number Of Records:

No.	Attribute Name	Data Type	Description	PK	FK	Reference
1.	<u>Payment_id</u>	VARCHAR2(10)	only numbers	✓		
2.	Payment_amount	NUMERIC(15,5)	NOT NULL			
3	<u>Loan_id</u>	VARCHAR2(10)			✓	LOAN
4	Payment_method	VARCHAR2(10)	NOT NULL			

Relation Name: BRANCH

Number Of Attributes: 3

Record Size:

Expected Number Of Records:

No.	Attribute Name	Data Type	Description	PK	FK	Reference
1.	<u>branch_id</u>	VARCHAR2(6)	only numbers	✓		
2.	adress	VARCHAR2(50)	NOT NULL, format:- country-gov-city-district-street			
3	Contact_info	VARCHAR2(100)				

Relation Name ATM

Number Of Attributes: 4

Record Size:

Expected Number Of Records:

No.	Attribute Name	Data Type	Description	PK	FK	Reference
1.	<u>atm_id</u>	VARCHAR2(10)	only numbers	✓		
2.	atm_location	VARCHAR2(50)	NOT NULL, format:- gov-city-district-street			
3	atm_status	VARCHAR2(10)	This field is used to indicate whether the ATM is available for use,(suspended) undergoing maintenance, out of service, NOT NULL			
4	atm_branch_id	VARCHAR2(6)			✓	BRANCH

Relation Name: EMPLOYEE

Number Of Attributes: 8

Record Size:

Expected Number Of Records:

No.	Attribute Name	Data Type	Description	PK	FK	Reference
1.	<u>emp_id</u>	VARCHAR2(10)	only numbers	✓		
2.	emp_address	VARCHAR2(50)	NOT NULL, format:- country-gov-city-district-street			
3	emp_phone	VARCHAR2(13)	only numbers, NOT NULL			
4	emp_email	VARCHAR2(32)				
5	emp_first_name	VARCHAR2(10)	NOT NULL			
6	emp_last_name	VARCHAR2(10)	NOT NULL			
7	emp_salary	NUMERIC(7)	NOT NULL			
8	emp_branch_id	VARCHAR2(10)			✓	BRANCH