CS331-H01 Group06;
Anbar Saleem,
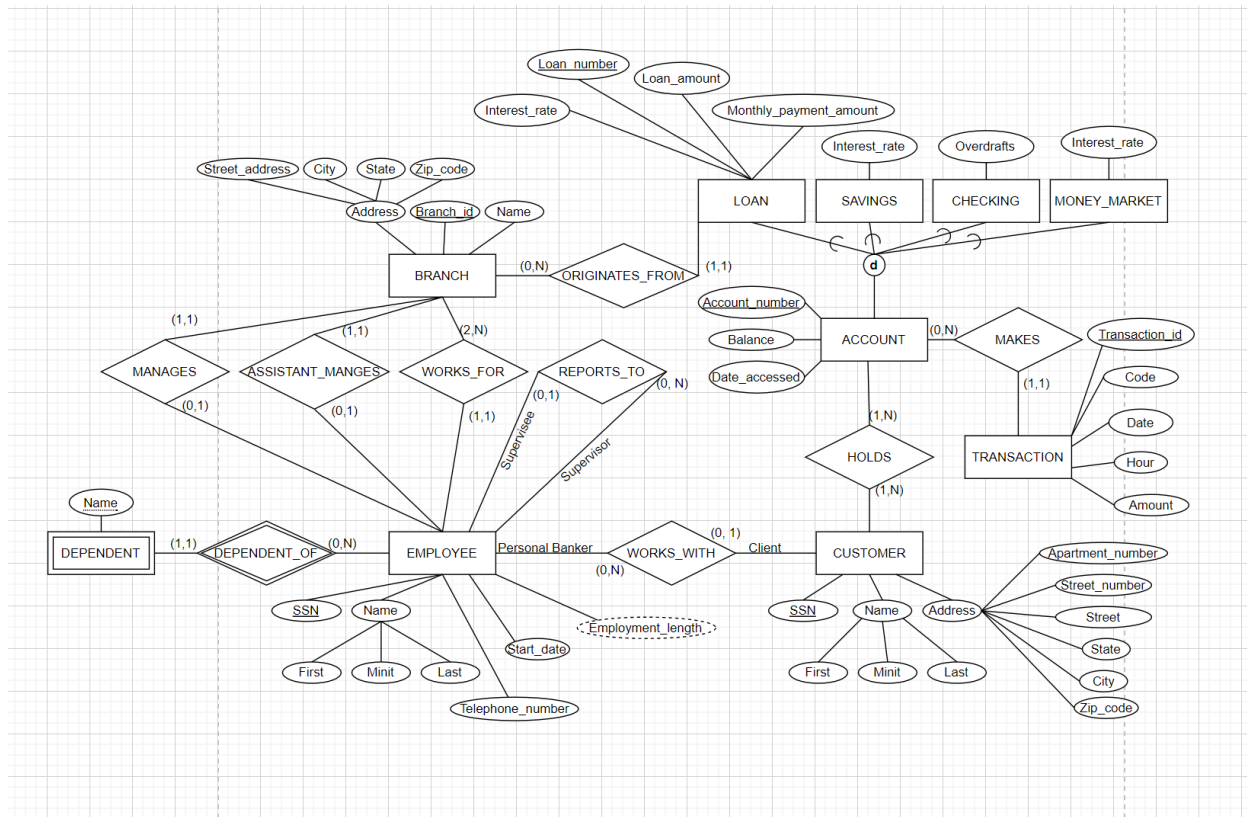Saumya Dwivedi

Phase 1

Business Rules Requirements:

• The bank is organized into branches. Each branch is in a particular city with an address and is identified by a unique branch-ID and a name. The bank monitors the assets of each branch. Each branch of the bank has a manager and an assistant manager who are employees of the bank.

• Bank customers are identified by their social security numbers. The bank stores each customer's name and address (apartment number, street number, state, city, and zip code). Customers may have several accounts and can take out loans that are managed as accounts as well. A customer may be associated with a particular branch and has a personal banker who works with the customer on their loan and bank transactions.

• Bank employees are also identified by their social security numbers. The bank stores the name and telephone numbers of each employee, and the names of the employee's dependents. The bank also keeps track of the employee's start date and, thus, length of employment. An employee at the bank works for one of the branches and reports to the manager of that branch. may have a manager and the manager is in charge of a certain number of employees.

• The bank offers several types of accounts, savings, checking, money market, and loan accounts. An account can be held by more than one customer, and a customer can have more than one account. Each account is assigned a unique account number. The bank maintains a record of each account balance and the most recent date on which the account was accessed by each customer holding the account. In addition, saving and loan accounts have fixed interest rates, money market accounts have variable interest rates regularly updated based on the stock market. and overdrafts are recorded for each checking account.

• A loan originates at a particular branch and can be held by one or more customers. A loan is identified by a unique loan number (similar to an account number). For each loan, the bank keeps track of the loan amount and the loan monthly re-payment amount.

• The bank keeps track of all the transactions. A transaction is identified by a unique code and has a type of name. For example, "WD" is the code for withdrawal, and "CD" is for customer deposit. When a customer makes a transaction, the transaction record should identify the transaction code, the date, the hour, the amount, and the account. Some transactions are free but the bank charges for most of them. If a customer makes a chargeable transaction,the charge is also registered as a chargeless transaction.

EER Schema Assumptions

Schema Assumptions

1. A branch must have one manager; an employee may or may not be a branch manager.
2. A branch must have one assistant manager; an employee may or may not be an assistant branch manager
3. A customer must hold at least one account; an account must be held by at least one customer.
4. The customer's personal banker is a part of the branch the customer is associated with; therefore, customer branch association isn't represented as a separate relationship.
5. An employee may be a personal banker for one or more customers or no customers; a customer may or may not have a personal banker.
6. An employee may or may not have one or more dependents, but a dependent must be related to only one employee.
7. A branch must have at least 2 employees (manager and assistant manager); an employee must work for a single branch.
8. An employee may or may not have a manager; an employee may or may not manage employees and if they do, it may be multiple employees.
9. Managing a branch and managing employees are two separate relationships; this was assumed due to confusing wording and typos in the Database Design Requirements.
10. A loan must originate from a branch; a branch may have 0 or more loans that originate from it.
11. A transaction must be made by a single account; an account may have 0 or more transactions associated with it.
12. While transactions are made by customers, the specific customer who made it does not need to be tracked in the database.
13. Chargeable transactions are recorded as two separate transactions; the first is the actual transaction while the second is the charge, thereby treating them both as chargeless transactions. Charges will be represented with their own codes.
14. The overdrafts attribute of a checking account refers to the amount of times a transaction is executed by a customer for which they do not have sufficient funds (counter).
15. Transaction_id is a unique attribute we created that is assigned to transactions to distinguish them from other transactions as transaction codes aren't unique since codes are assigned based on the types of transactions being made.

EER Schema Diagram

Relational Schema

BRANCH

Branch_id	Name	Street_address	City	State	Zip_code	Manager_SSN	Assistant_manager_SSN

EMPLOYEE

SSN	First	Minit	Last	Telephone_number	Start_date	Super_SSN	Branch_id

DEPENDENT

Employee_SSN	Name

CUSTOMER

SSN	First	Minit	Last	Apartment_number	Street_number	Street	City	State	Zip_code	Personal_banker_SSN

TRANSACTION

Transaction_id	Code	Date	Hour	Amount	Account_number

HOLDS

Customer_SSN	Acct_number

ACCOUNT

Account_number	Balance	Date_accessed

LOAN

Account_number	Interest_rate	Loan_number	Loan_amount	Monthly_payment_amount	Branch_id

SAVINGS

Account_number	Interest_rate

CHECKING

Account_number	Overdrafts

MONEY_MARKET

Account_number	Interest_rate