# CS3700_ASSIGNMENT_1
# GROUP_8
# DATABASE- BANKING SYSTEM

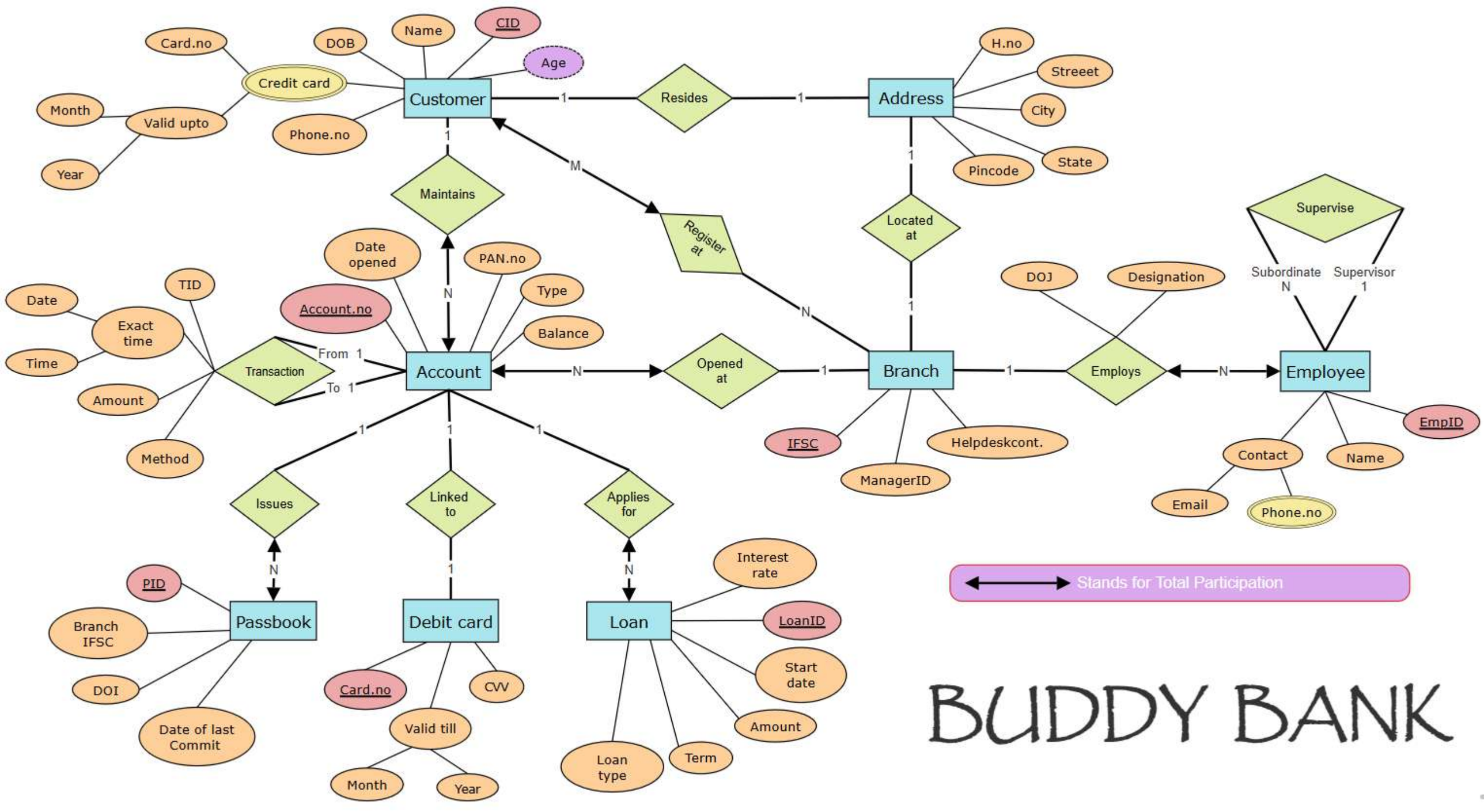
## Domain Description:

In a bank, there are several branches. Each branch has a manager, help desk contact number and a unique IFSC code. Branch is located at a certain address, which consists of details such as house number, street, city, pin code and state. A customer can register themselves at various branches of the bank, and each branch has several customers. Customer details such as a unique customer id, name, phone number, DOB(date of birth), age, credit card details are maintained. Customer resides at an address. A customer can avail several credit cards from the bank. Each credit card has a unique card number and a validity till expiry month and year. After a credit card expires, a customer can avail another credit card with a new card number. Several employees work at each branch of the bank. Each employee may be supervised by another employee called the supervisor. One employee can supervise multiple employees who are his/her subordinates. Details of the employee, such as the employee ID, name, date of join, designation, email id and one or more phone numbers are maintained. A customer can have multiple accounts in the bank. Each account is registered with a branch of the bank. Details of an account such as account number, balance, account type, PAN number of the holder and date of opening the account are maintained. Each account can be linked to a debit card. A debit card has its unique card number, CVV and validity till expiry month and year. After a debit card expires, a new debit card can be availed. Bank can issue multiple passbooks for each account a customer maintains. A passbook has its unique passbook id, DOI (date of issue), date of last commit and IFSC code of the branch in which it is issued. A customer can apply for multiple loans through each account they hold in the bank. Loan record includes details such as unique loan id, loan type, loan amount, loan term, start date, interest rate of loan. Customers can make transactions from one account to any other account in the bank. Each transaction has its unique transaction id, transaction method, amount and exact time having date and time of transaction.

## Purpose for this Banking system database:

The banking database system represented in the relational schema is designed to efficiently manage banking operations, including customer details, accounts, transactions, credit/debit cards, loans, and employee records. The system aims to:

- Facilitate Secure and Efficient Transactions – Tracks transactions between accounts, ensuring proper record-keeping and fraud detection.
- Manage Customer Information and Services – Stores customer details, linked accounts, debit/credit cards, and loan details for personalized banking.
- Support Employee and Branch Operations – Handles employee records, their roles, and branch assignments to maintain structured banking operations.
- Enable Loan and Card Management – Keeps track of issued loans, credit and debit cards, along with expiry details.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Year
Loan
Interest rate
LoanID
Start date
Amount
Term
Loan type
Stands for Total Participation
BUDDY BANK

## Explanation of entities:

Customer:

This Entity is used to keep track of details of a customer of the bank. Attributes of the customer entity are name, cid(customer id), dob(date of birth), phone no, age and a multi valued composite attribute credit card which has card number and validity month and year.

Employee:

This entity is used to keep track of employee details. Attributes of the employee entity are employee id, name and composite attribute contact which has email and multi valued attribute phone No.

Branch:

This entity is used to keep track of details of a particular branch. Attributes of the branch entity are IFSC(unique code for the branch), helpdesk contact and Manager_id(employee id Of manager of the branch).

Address:

This Entity is used to store the components of an address. Address entity has the following attributes: H.no(House number), street, city, state and pincode.

Account:

This entity is used to keep track of an account's details. Attributes of the account entity are Account no, Date opened(date of opening the account), PAN no, Account type(savings account, salary account, fixed deposit account), balance.

Debit card:

This Entity is used to keep track of the details of a debit card issued by the bank. Attributes of the debit card are card no, CVV and a composite attribute 'Valid till' which has attributes month and year (expiry month and year).

Passbook:

This entity is used to keep track of passbooks issued by the bank. Attributes of the passbook entity are PID(passbook id), Branch_IFSC(IFSC code of bank which issued the passbook), DOI(date of issue) and date of last commit.

Loan:

This entity is used to keep track of loans applied by accounts in the bank. Attributes of the loan are LoanID, loan type, amount, term, start date and interest rate.

## Explanation of Relationships:

1. Employs(Branch and Employee): An employee works at a branch (one-to-many). This relation has attributes DOJ(date of joining of the employee) and designation(of employee in the branch).
2. Supervise(Employee to Supervisor): An employee can be supervised by another employee (many-to-one).
3. Registered_at(Branch and Customer): A customer can register at multiple branches (many-to-many).
4. Opened_at(Account and Branch): In a branch, several accounts can be opened(many-to-one).

5. Resides( Customer and Address): Each customer lives at an address(one-to-one).
6. Located_at(Branch and Address): Each branch is located at an address(one-to-one).
7. Maintains(Customer and Account): A customer can have multiple accounts (one-to-many).
8. Applies_for(Account and Loan): An account can have multiple loans (one-to-many).
9. Linked_to(Account and Debit Card): An account can have one debit card (one-to-one).
10. Issues(Account and Passbook): An account can have multiple passbooks (one-to-many).
11. Transaction(Account to Account): A transaction involves two accounts (many-to-many). This relation has attributes tid(transaction id), method(upi/netbanking), amount and composite attribute ‘exact time’(of the transaction) which has date and time attributes.

These relationships and attributes collectively form a comprehensive banking database model that supports various banking operations and services.

## Relational Schema

Branch(IFSC, Manager_ID, Helpdeskcontact, Hno, Street, City, State, Pincode)

Employee(EmpID, Name, Branch_IFSC, Email, DOJ, Designation)

Customer(CID, Name, DOB, Phoneno, Hno, Street, City, State, Pincode)

Account(Accno, CID, Branch_IFSC, Date_opened, PANno, Account_type, Balance)

Loan(LoanID, Accno, Start_date, Amount, Term, Loan_type, Interest_rate)

DebitCard(Cardno, Accno, CVV, exp_month, exp_year)

Passbook(PID, Accno, Branch_IFSC, DOI, Date_of_last_commit)

Employee_phone(EmpID, Phoneno)

Customer_creditcard(CID, Cardno, exp_month, exp_year)

Supervise(Supervisor, Subordinate)

Transaction(TID, from_acc, to_acc, method, Date ,Time, Amount)

Registered_at(Branch_IFSC, CID)

# RELATIONAL SCHEMA

Branch(IFSC, Manager_ID, Helpdeskcontact, Hno, Street, City, State, Pincode)

Employee(EmpID, Name, Branch_IFSC, Email, DOJ, Designation)

Customer(CID, Name, DOB, Phoneno, Hno, Street, City, State, Pincode)

Account(Accno, CID, Branch_IFSC, Date_opened, PANno, Account_type, Balance)

Loan(LoanID, Accno, Start_date, Amount, Term, Loan_type, Interest_rate)

DebitCard(Cardno, Accno, CVV, exp_month, exp_year)

Passbook(PID, Accno, Branch_IFSC, DOI, Date_of_last_commit)

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