Fundamentals of Database Systems (Elmasri, Ramez; Navathe, Shamkant), 7th edition, Pearson.

CMP_SC 3380
Assignment 2
(Rao)

Due date: Feb 21, 2024 (11:59 PM)

1. Consider the ER diagram shown below for part of a BANK database (Fig. 3.22 in the textbook). Each bank can have multiple branches, and each branch can have multiple accounts and loans.
    a. List the strong (nonweak) entity types in the ER diagram. (2 points)
        i. **Strong entity types: Bank, Account, Loan, Customer**
    b. Is there a weak entity type? If so, give its name, partial key, and identifying relationship. (2 points)
        i. **Bank_branch is a weak entity type. It's partial key is the Branch_no and its identifying relationship is "Branches", which connects it to the Bank attribute, the identifying owner.**
    c. What constraints do the partial key and the identifying relationship of the weak entity type specify in this diagram? (2 points)
        i. **The partial key and identifying relationship of the weak entity type specify that the Bank_Branch has a total participation constraint, or existence dependency, with respect to the "Branches" identifying relationship.**
    d. List the names of all relationship types, and specify the participation of an entity type in a relationship type. (4 points)
        i. Relationship Types:
            1. **Branches: A 1:1 relationship type with total participation from the Bank and Bank_Branch attributes**
            2. **Accts: A 1:N relationship type with partial participation from the Bank_Branch attribute because not all branches necessarily have accounts, and total participation for the Account attribute.**
            3. **Loans: A 1: N relationship type with partial participation from the Bank_Branch attribute because not all branches necessarily have loans, and total participation from the Loan attribute.**
            4. **A_C: A M:N (many:many) relationship type with total participation from the Account attribute but only partial participation from the Customer attribute.**
            5. **L_C: A M:N relationship type with total participation from the Account attribute but only partial participation from the Customer attribute.**

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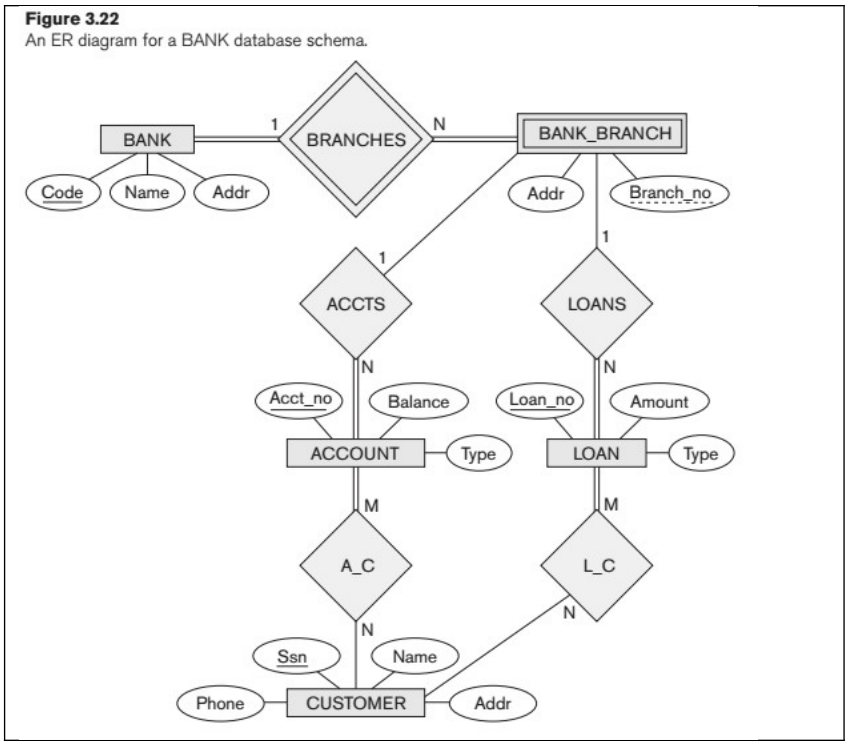
Figure 3.22
An ER diagram for a BANK database schema.



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2. Consider a MAIL_ORDER database in which employees take orders for parts from customers. The data requirements are summarized as follows:
    a. The mail order company has employees, each identified by a unique employee number, first and last name, and Zip Code.
    b. Each customer of the company is identified by a unique customer number, first and last name, and Zip Code.
    c. Each part sold by the company is identified by a unique part number, a part name, price, and quantity in stock.
    d. Each order placed by a customer is taken by an employee and is given a unique order number. Each order contains specified quantities of one or more parts. Each order has a date of receipt as well as an expected ship date. The actual ship date is also recorded.

       Design an ER diagram for the mail order database. Clearly state any assumptions that you have made. (15 points)

       MAIL ORDER DATABASE:
       Assumptions:
       Customers can place more than one order.
       Not all employees take orders.