

PRACTICE PROBLEM SET #3

CSC 261/461 (Database Systems), Spring 2018,
University of Rochester

Problem 1

Drik Gallery, a renowned photo and painting exhibitor, would like to hire you to prepare their database.

The gallery keeps information about artists such as their names, address, age, and sex.

All the artists fall into two categories, painter, and photographer (Yes, photography is an art!).

For each piece of artwork, its unique id, the artist, the year it was produced, its name, description, and price is stored. Each artwork can be produced by only one artist.

Artworks are subdivided into two categories, paintings, and photos.

Photos have information about the camera used to capture the photo, camera's exposure time, focal length, and aperture. The paintings have information about its genre, which can be identified by an integer.

Details of the genres:

1. **History Painting:** Religious, historical or allegorical work, with a moral message.
2. **Portrait Art:** Includes individual, group or self-portraits.
3. **Genre Painting:** Scenes of everyday life.
4. **Landscape Painting:** Paintings whose principal content is a scenic view.
5. **Still Life Painting:** An arrangement of domestic objects or everyday items.

Finally, the gallery keeps information about customers. For each customer, the gallery stores his/her customer id, name, address, and the artists and the artworks the customer is interested in. Customers address has the following divisions-Street Address, City, State, Zip.

Draw an ER diagram for this database.

Problem 2

Consider the ER diagram shown in Figure 1 for part of a BANK database. Each bank can have multiple branches, and each branch can have multiple accounts and loans.

1. List the strong (nonweak) entity types in the ER diagram.
2. Is there a weak entity type? If so, give its name, partial key, and identifying relationship.
3. What constraints do the partial key and the identifying relationship of the weak entity type specify in this diagram?
4. List the names of all relationship types, and specify the (min, max) constraint on each participation of an entity type in a relationship type.
5. List concisely the user requirements that led to this ER schema design.
6. Suppose that every customer must have at least one account but is restricted to at most two loans at a time, and that a bank branch cannot have more than 1,000 loans. How does this show up on the (min, max) constraints?

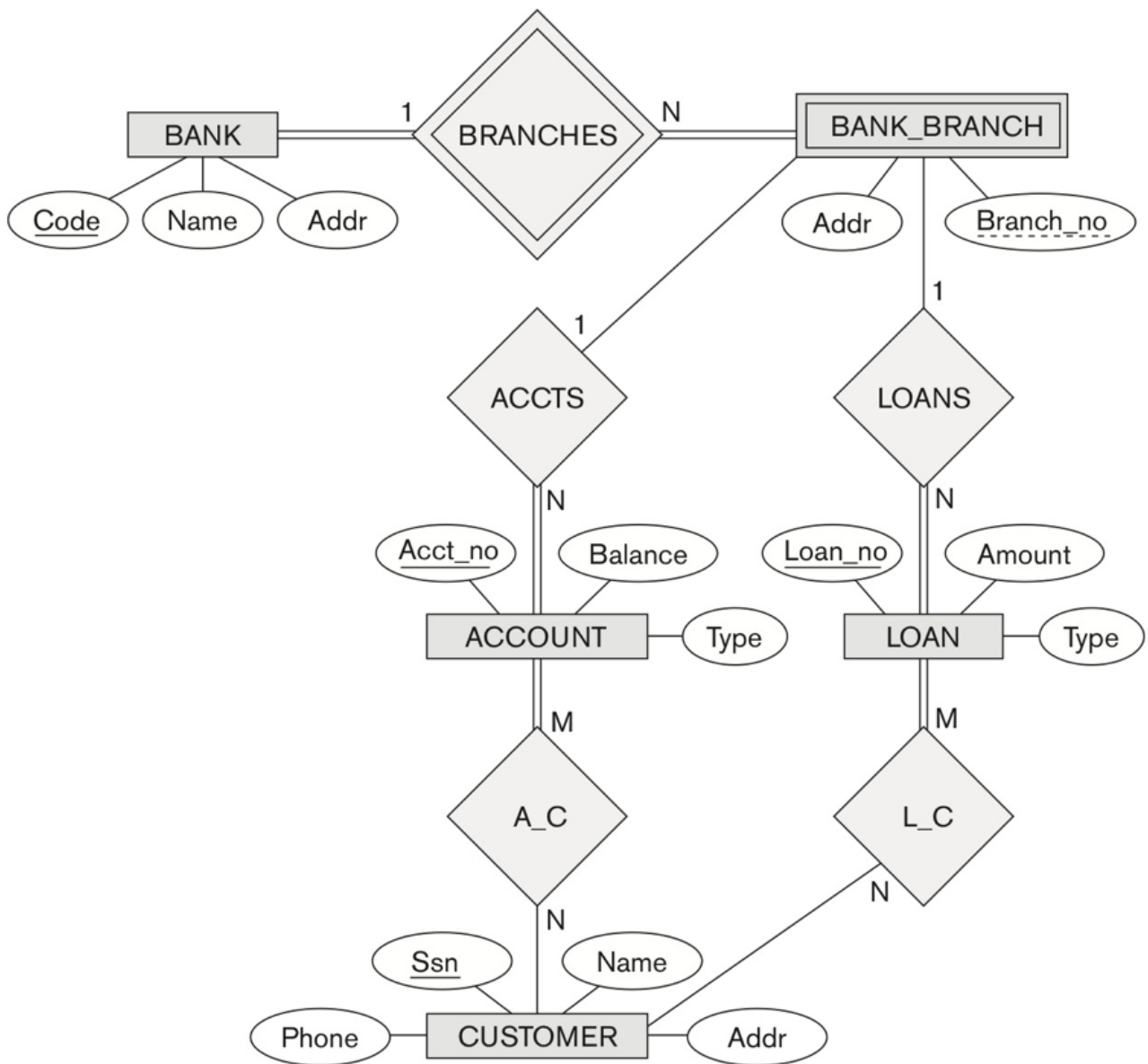


Figure 1: An ER diagram for a BANK database schema (ref: Fundamental of Database Systems by Elmasri and Navathe)