Subject: Introduction to Databases

Subject code: CSE 3151

Assignment 1

This assignment is designed to give you practice with the concepts of

- Database design using entity relationship model
- Mapping an ER diagram to relational model
- Constructing schema diagram of a database

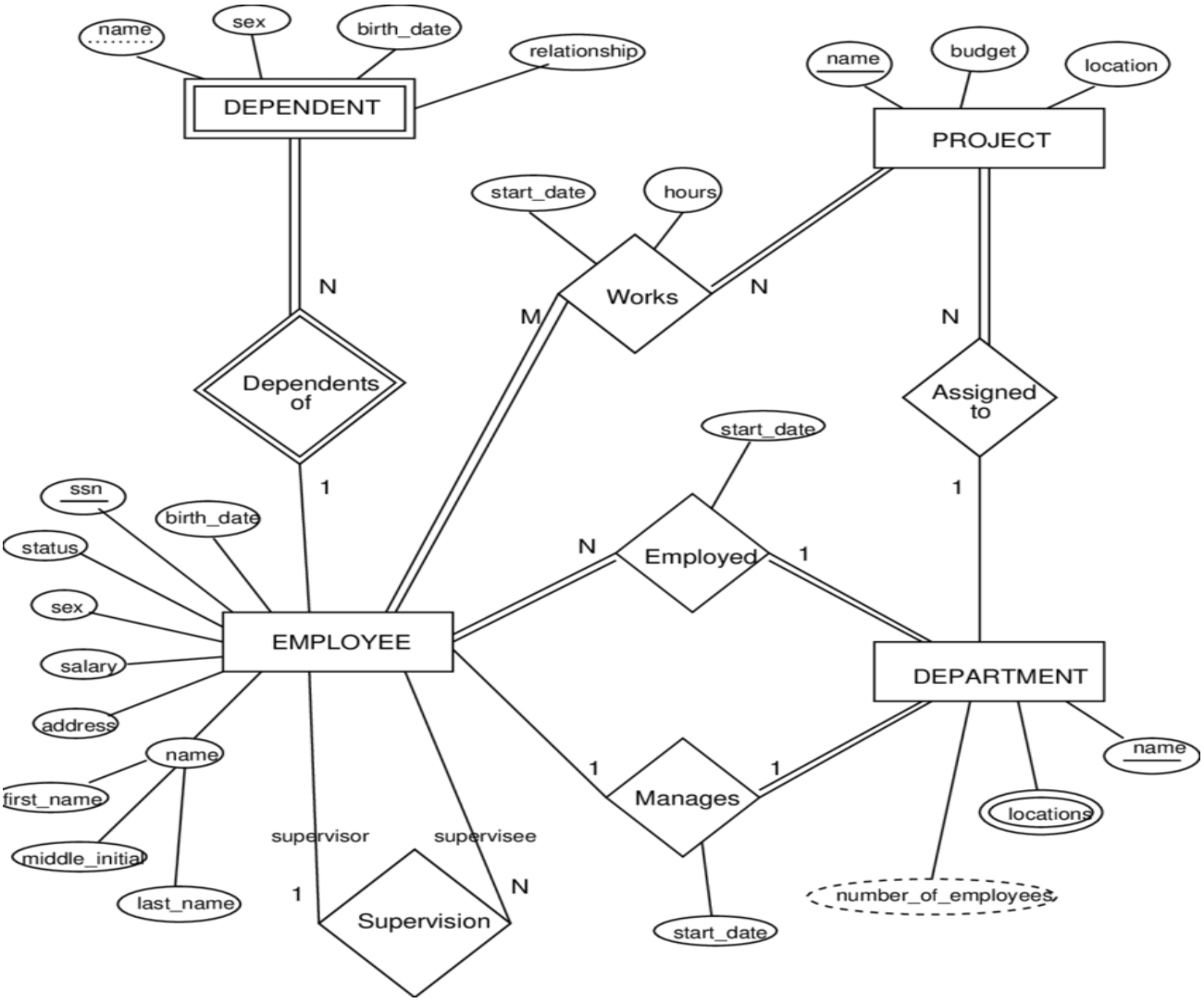
1. Design a database for an online bookstore using ER model. The bookstore includes information about the books, author, publisher, customer. Each book is represented by its ISBN number, title, year and price. Each book has a unique ISBN number. Author of the book is characterized by author_id, name and address. Each author has a unique author_id. Address of the author includes city, state, country and pin_code. The association of author and book is represented by the relationship named as written_by. One book may have more than one author. Many books written by same author is available in the store. The publisher of the Book is represented by its name, address, phoneno. Publishers are uniquely identified by its name. One publisher may have multiple phoneno.s. Address of the publisher includes city, state, country and pin_code. The association of publisher and book is represented by the relationship named as published_by. One book is published by exactly one publisher. The customer of the store is represented by its email, name, address, phoneno. Each customer should have one unique email. Address of the publisher includes city, state, country and pin_code. One phoneno. is included for each customer in the database. Customer has a shopping_basket. The shopping_basket is represented by its basket_id. Association between customer and shopping_basket is represented by the relationship named as basket_of. One customer has exactly one shopping_basket. The shopping basket may contain many books. Same book can be included in multiple shopping_baskets. Association between book and shopping_basket is represented by the relationship named as contains. When book is added to shopping_basket a number field associated with relationship contains is updated.

   Draw the ER diagram for the above online bookstore representing entity set, relationship set, mapping cardinality and participation constraint.

2. A company-wide information system is maintained to keep up-to-date information on the processing and current location of each shipped item. Shipped items are characterized by item_number (which is unique), weight, dimensions, insurance_amount, destination, and final delivery_date. Shipped items are received at a single retail center. Retail centers are characterized by their type, uniqueID, and address. Shipped items make their way to their destination via one or more standard transportation events (i.e., flights, truck deliveries). These transportation events are characterized by a unique scheduleNumber, a type (e.g, flight, truck), and a deliveryRoute.

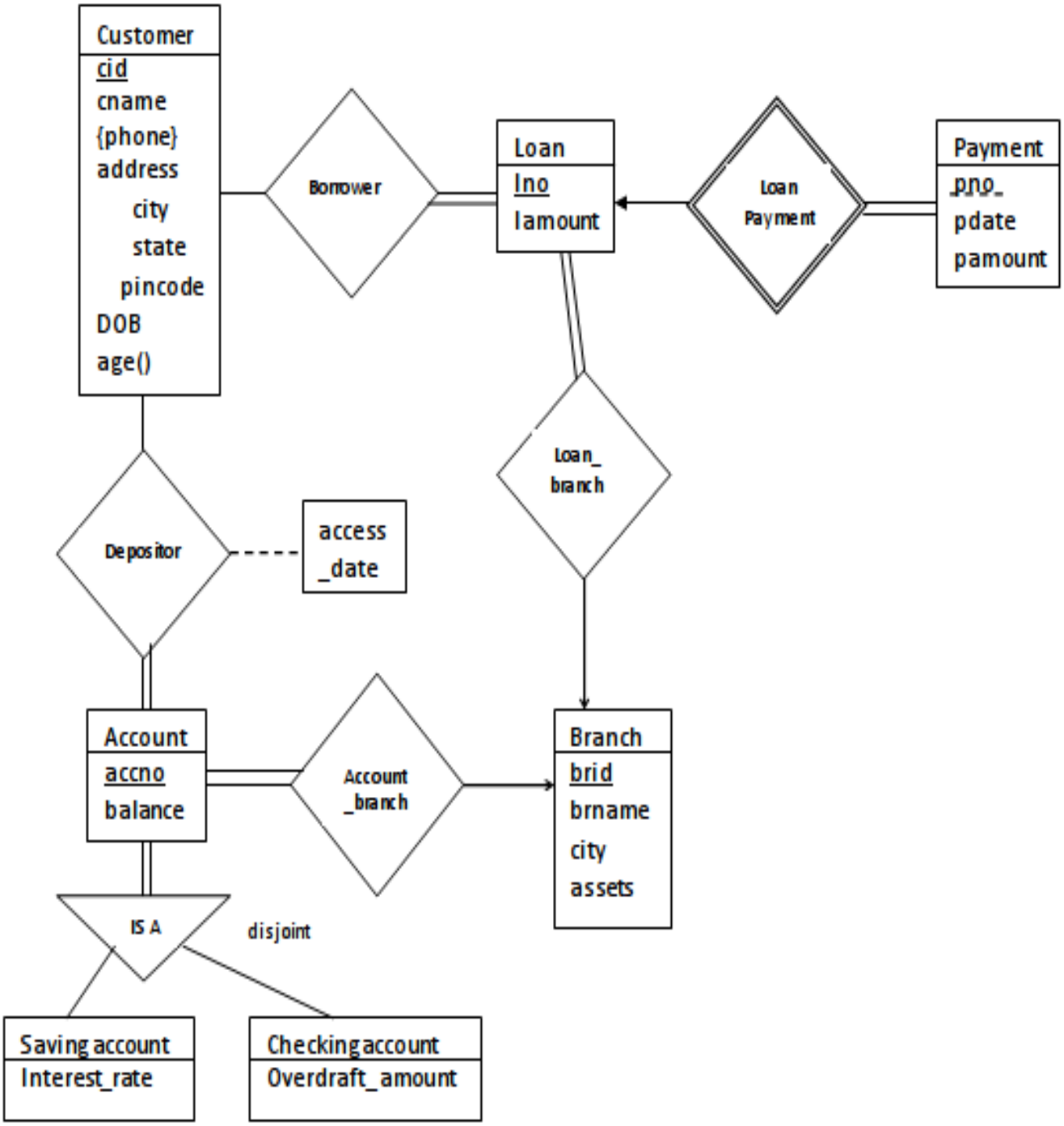
   Draw an Entity Relationship diagram that captures this information about the system indicating the entity set, relationship set, mapping cardinality and participation constraint.

3. Consider the following ER diagram and list the entity sets with its attributes and its type, relationship sets with its degree, mapping cardinality and participation constraints.



4. Translate the ER diagram represented in que. 3 to its corresponding relational schema. Also indicate the primary key and foreign key for the relational schema.

5. Map the following ER diagram to its corresponding relational schema. Also indicate the primary key and foreign key for the relational schema.



6. Draw the schema diagram for the relational schema resulted in que. 5.

7. Identify the referential integrity for the following relational schema and draw its schema diagram.
   Person (driver_id, name, address)
   Car (license, model, year)
   Accident (report_number, date, location)
   Owns (driver_id, license)
   Participated (report_number, license, driver_id, damage_amount)