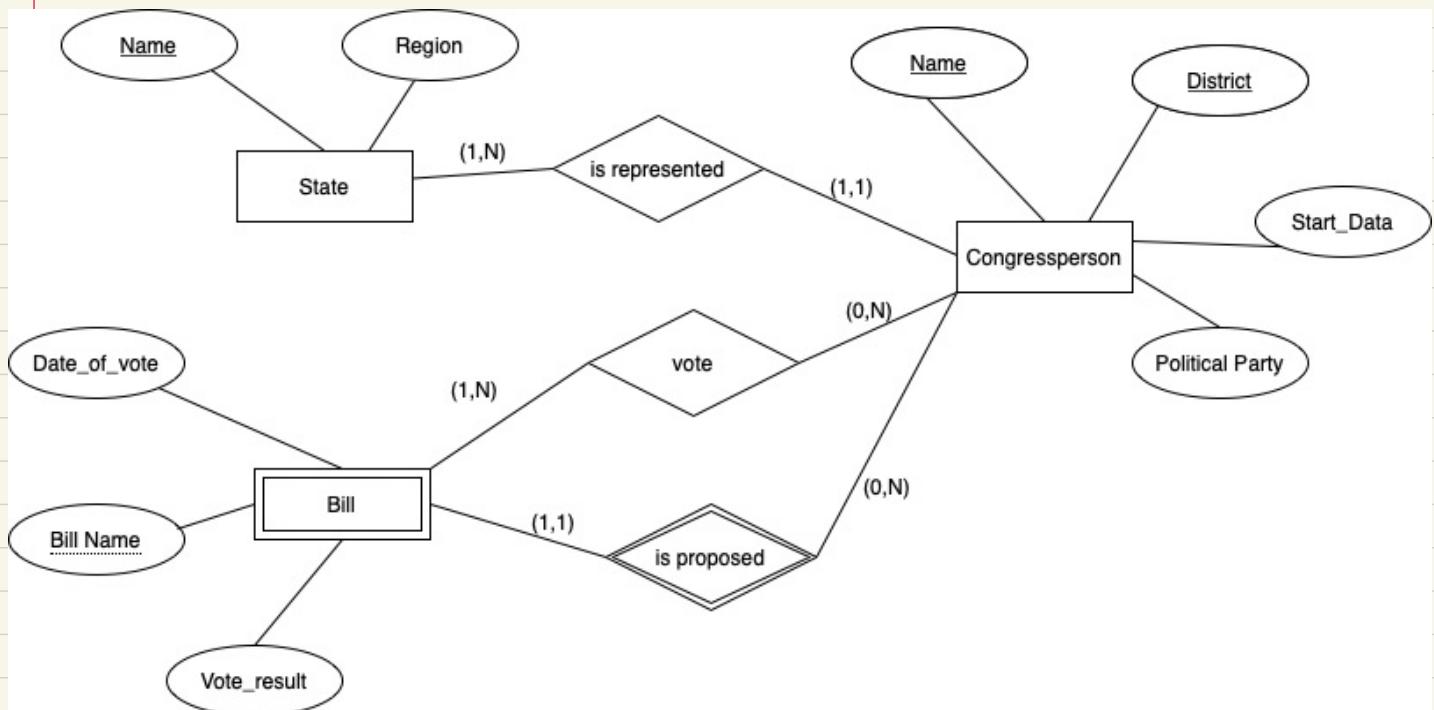
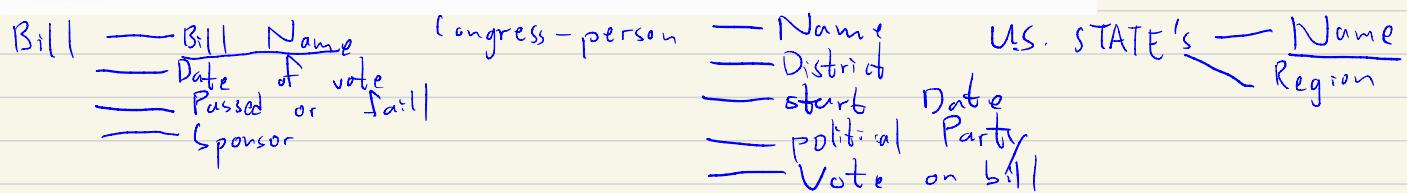


HW 1

HW 1.1

Design an ER schema for keeping track of information about votes taken in the U.S. House of Representatives during the current two-year congressional session. The database needs to keep track of each U.S. STATE's Name (e.g., 'Texas', 'New York', 'California') and include the Region of the state (whose domain is {'Northeast', 'Midwest', 'Southeast', 'Southwest', 'West'}). Each CONGRESS_PERSON in the House of Representatives is described by his or her Name, plus the District represented, the Start_date when the congressperson was first elected, and the political Party to which he or she belongs (whose domain is {'Republican', 'Democrat', 'Independent', 'Other'}). The database keeps track of each BILL (i.e., proposed law), including the Bill_name, the Date_of_vote on the bill, whether the bill Passed_or_failed (whose domain is {'Yes', 'No'}), and the Sponsor (the congressperson(s) who sponsored—that is, proposed—the bill). The database also keeps track of how each congressperson voted on each bill (domain of Vote attribute is {'Yes', 'No', 'Abstain', 'Absent'}). Draw an ER diagram using the notation used in class for this application. State clearly all assumptions that you make.



- Reasoning:
1. States is represented by at least 1 person and at most N people based on the size of the State. A congressperson can only represent 1 state
 2. A congressperson can vote on lots of bill or they can not vote at all. A bill need at least 1 person vote and up to N people
 3. Bill is weak because if no congressperson propose the bill, it cannot be existed. Congressperson can propose 0 bill or lots of bill. A bill needs a owner, and it should only be 1 person who proposed it

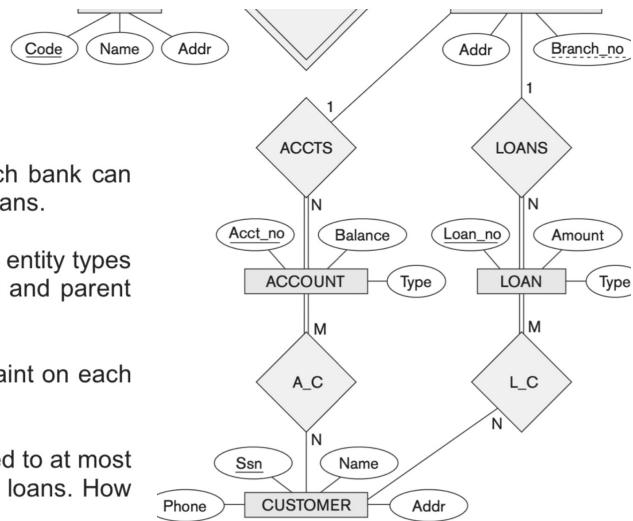
HW 1.2

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

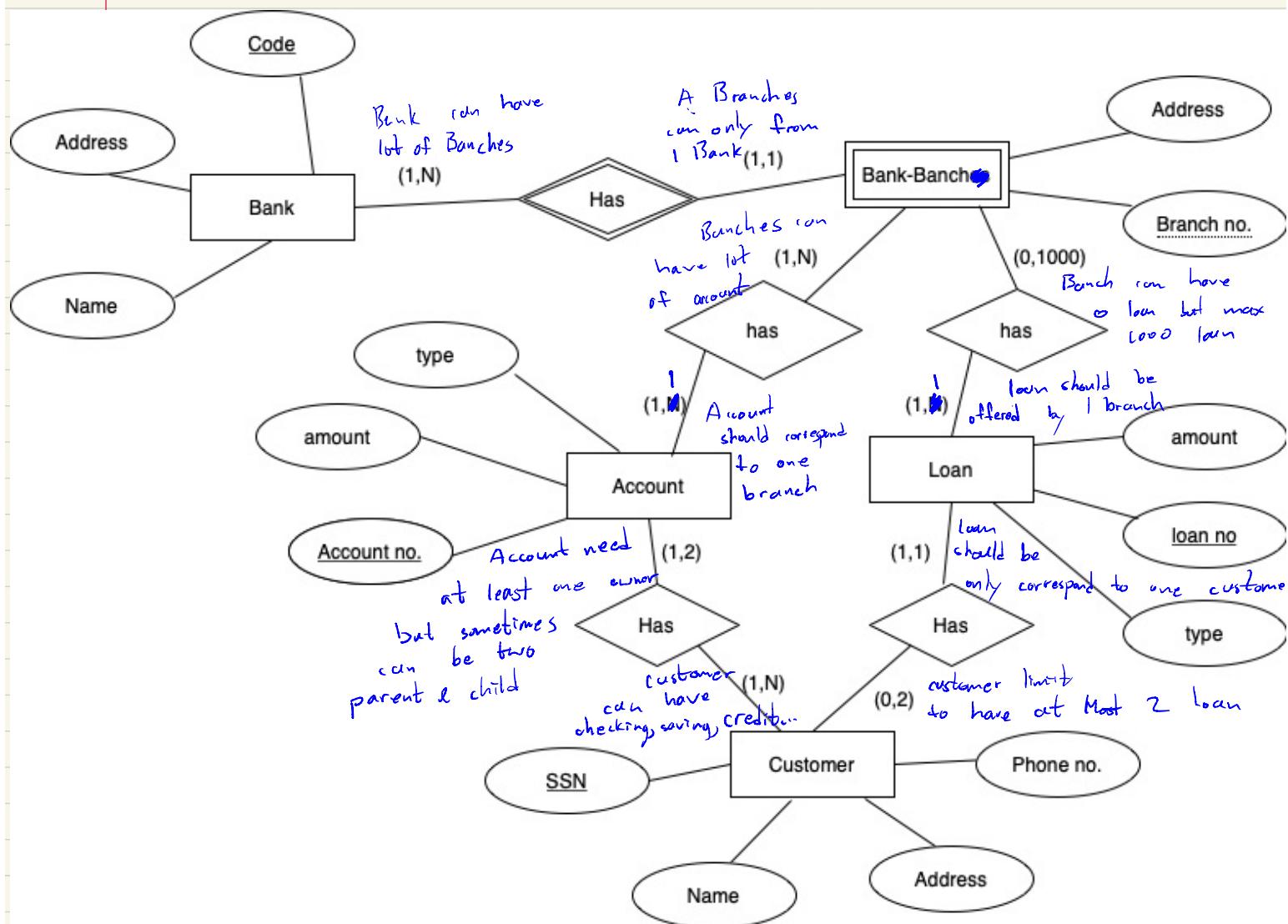
Convert this into the notation we use in Class, showing the strong and weak entity types using single and double rectangles and be sure to include the partial key and parent relationship.

List the names of all relationship types, and specify the (min, max) constraint on each participation of an entity type in a relationship type. Justify your choices.

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?

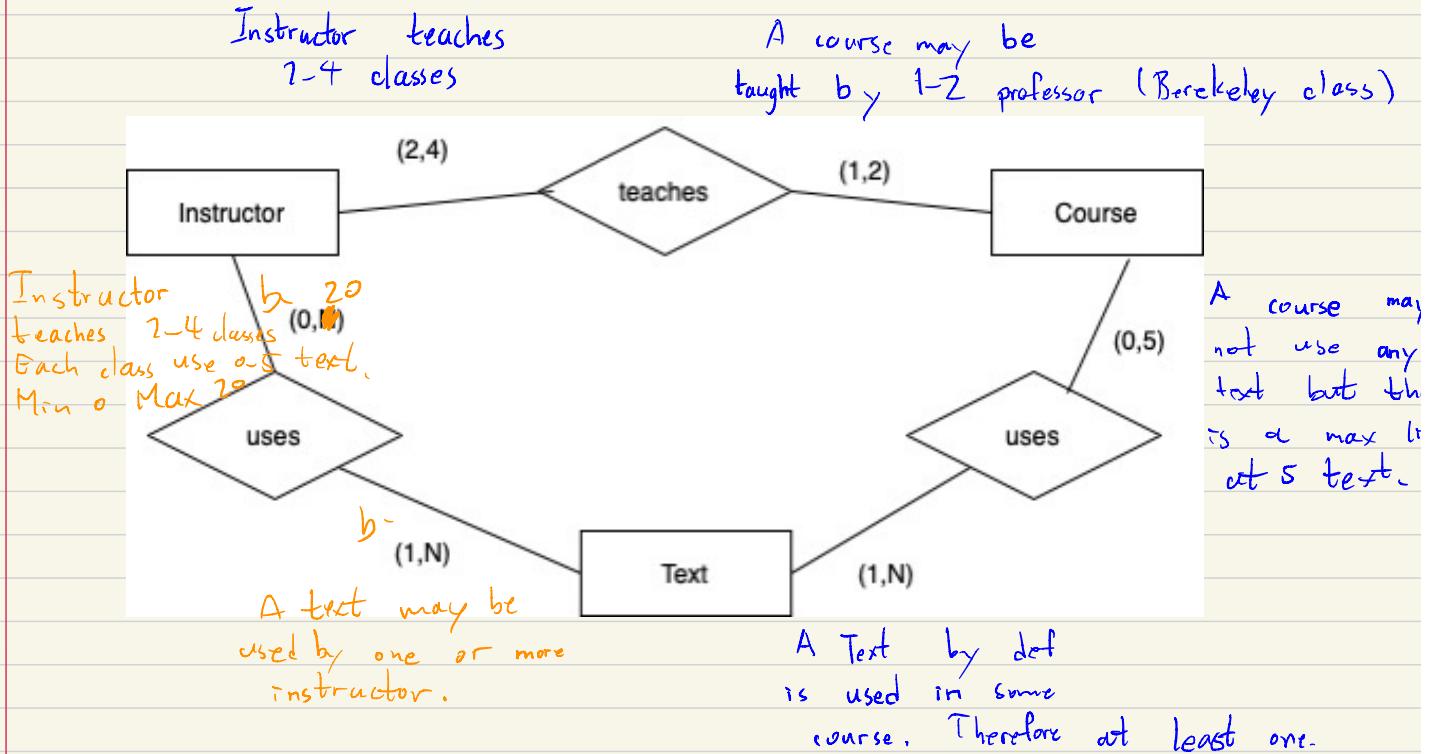
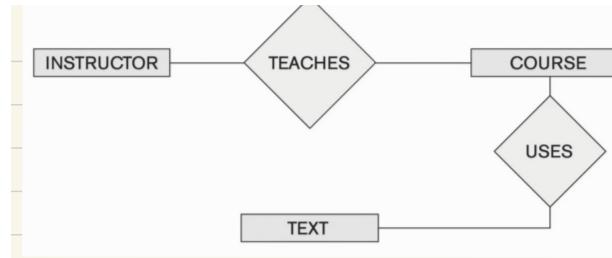


Relationship - has
Constraint down below



Consider the ER diagram in figure below. Assume that a course may or may not use a textbook, but that a text by definition is a book that is used in some course. A course may not use more than five books. Instructors teach from two to four courses.

- Indicate the (min, max) constraints on this diagram. State clearly any additional assumptions you make.
- Let's say we add a relationship USES to indicate that an INSTRUCTOR uses a TEXT. What (min, max) constraints would you put on the relationship? Why?



Consider a MAIL_ORDER database in which employees take orders for parts from customers. The data requirements are summarized as follows:

- The mail order company has employees, each identified by a unique employee number, first and last name, and Zip Code.
- Each customer of the company is identified by a unique customer number, first and last name, and Zip Code.
- Each part sold by the company is identified by a unique part number, a part name, price, and quantity in stock.
- 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.

Draw an ER using class notation with all cardinality constraints.

