IEOR 215: Homework 2

EER Diagram

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Problem 1

Consider a GRADE_BOOK database in which instructors within an academic department record points earned by individual students in their classes. The data requirements are summarized as follows:

- Each student is identified by a unique identifier, first and last name, and an e-mail address.
- Each instructor teaches certain courses each term. Each course is identified by a course number, a section number, and the term in which it is taught. For each course he or she teaches, the instructor specifies the minimum number of points required in order to earn letter grades A, B, C, D, and F. For example, 90 points for an A, 80 points for a B, 70 points for a C, and so forth.
- Students are enrolled in each course taught by the instructor.
- Each course has a number of grading components (such as midterm exam, final exam, project, and so forth). Each grading component has a maximum number of points (such as 100 or 50) and a weight (such as 20% or 10%). The weights of all the grading components of a course usually total 100.
- Finally, the instructor records the points earned by each student in each of the grading components in each of the courses. For example, student 1234 earns 84 points for the midterm exam grading component of the section 2 course CSc2310 in the fall term of 2009. The midterm exam grading component may have been defined to have a maximum of 100 points and a weight of 20% of the course grade.

Design an EER diagram for the GRADE_BOOK database. State clearly any assumptions you make.

Assumptions :

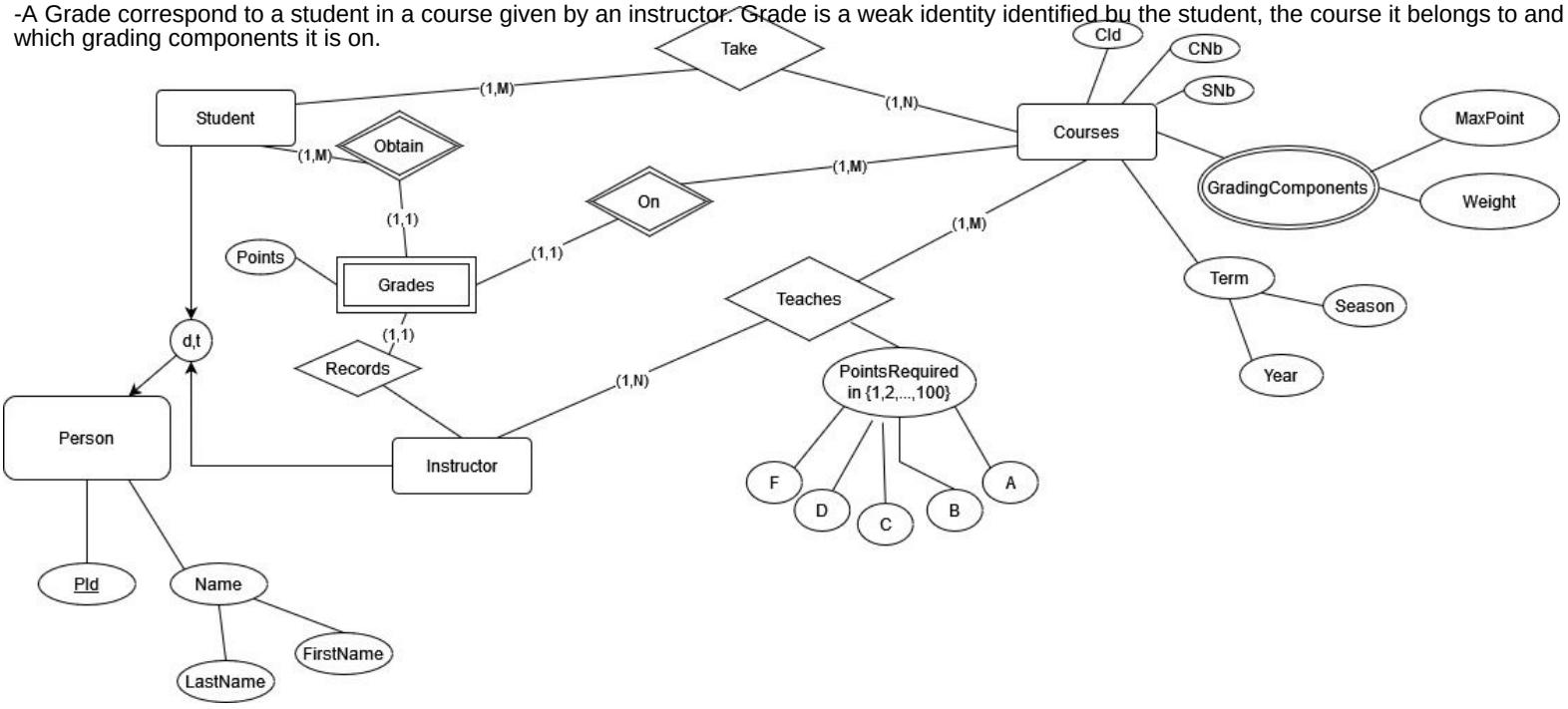
- Person is a superclass containing Student and Instructor.
The junction between Instructor and Student is disjoint and total, because a student can't be an Instructor and an Instructor can't be a student. It is also total because to be in the data base you either have to be a teacher or a student.
The Student_Id is absorbed by Pid which becomes an identifier also for Instructor.

- A student is enrolled in at least on course and each course has a least one grading component so a student has at least on grade.

-An instructor Teaches at least one class so records at least one grade.

-A course is taken by at least one student. A course can be taught by at least one instructor.

-A Grade correspond to a student in a course given by an instructor. Grade is a weak identity identified bu the student, the course it belongs to and which grading components it is on.



Problem 2

Consider an ONLINE_AUCTION database system in which members (buyers and sellers) participate in the sale of items. The data requirements for this system are summarized as follows:

- The online site has members, each of whom is identified by a unique member number and is described by an e-mail address, name, password, home address, and phone number.
- A member may be a buyer or a seller. A buyer has a shipping address recorded in the database. A seller has a bank account number and routing number recorded in the database.
- Items are placed by a seller for sale and are identified by a unique item number assigned by the system. Items are also described by an item title, a description, starting bid price, bidding increment, the start date of the auction, and the end date of the auction.
- Items are also categorized based on a fixed classification hierarchy (for example, a modem may be classified as COMPUTER → HARDWARE → MODEM).
- Buyers make bids for items they are interested in. Bid price and time of bid are recorded. The bidder at the end of the auction with the highest bid price is declared the winner, and a transaction between buyer and seller may then proceed.
- The buyer and seller may record feedback regarding their completed transactions. Feedback contains a rating of the other party participating in the transaction (1–10) and a comment.

Design an EER diagram for the GRADE_BOOK database. State clearly any assumptions you make.

Assumptions :

- Members is the superclass including Buyers and Sellers.

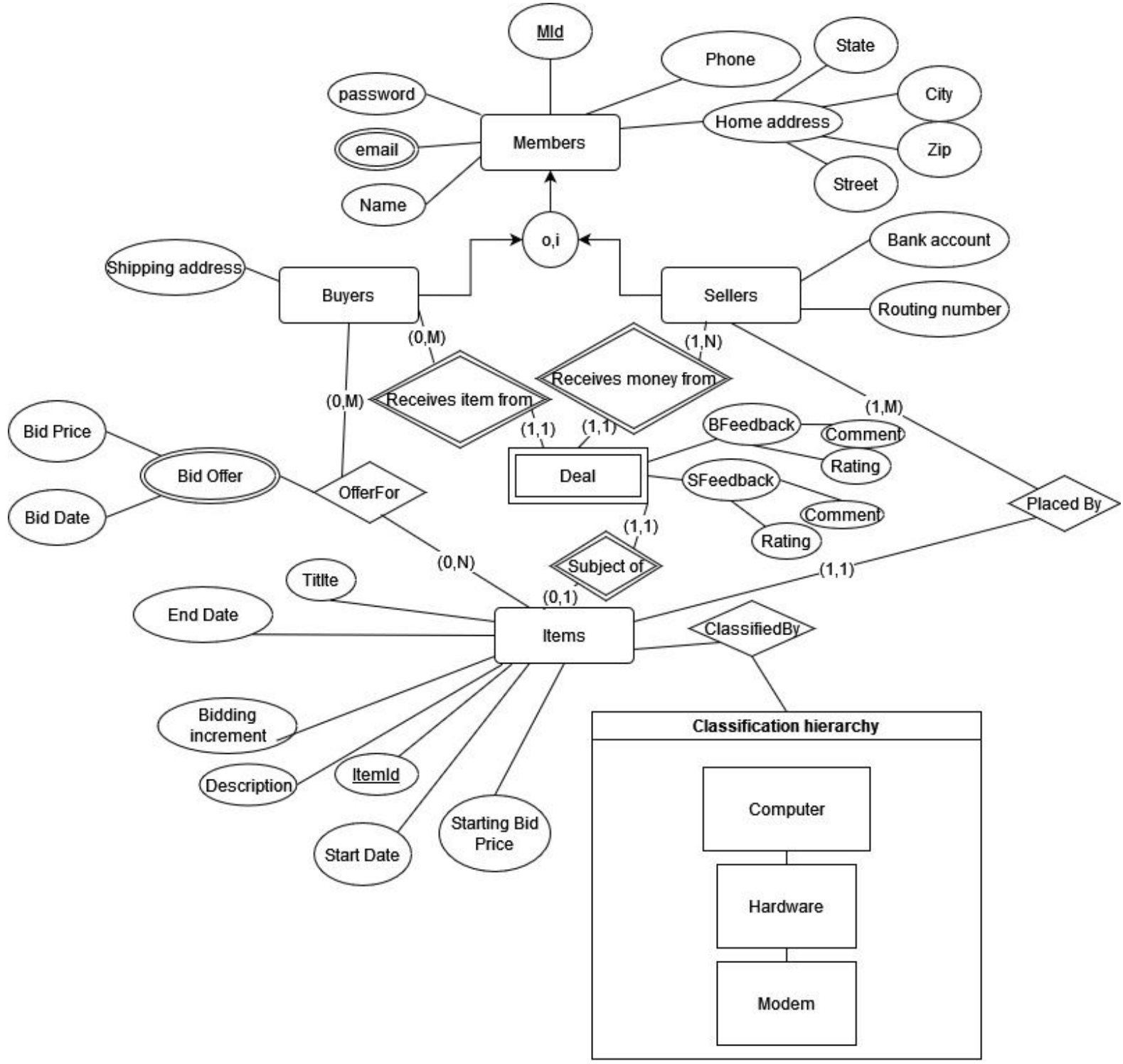
- Buyers have no obligations to do offers and so no obligations to take part in any deal.

- Sellers have to place at least on item.

- There exist a classification hierarchy which classifies every item.

- Items are placed by exactly one seller. They are the subject of maximum one deal, or 0 if no one want to buy it. An Item can receive many offers, but can also not receive any.

- Deals are uniquely identified by the Item they are subject of. A deal is in relation with exactly one buyer and exactly one seller.


MId
Phone
State
password
City
Home address
email
Members
Zip
Name
Street
o,i
Bank account
Shipping address
Buyers
Sellers
Routing number
(0,M)
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Receives item from
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Bid Price
BFeedback
Comment
Bid Offer
Deal
Rating
OfferFor
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TitIte
End Date
Items
ClassifiedBy
Bidding increment
Classification hierarchy
Description
ItemId
Computer
Starting Bid Price
Hardware
Start Date
Modem