CS 3200 - Database Design - Fontenot

Homework 05 - ER Modeling

Regular Submission Deadline: Tuesday March 19 @ 11:59 to GradeScope

Regular Extra Credit (3 points total) Early Submission Deadline: Sunday Mar 17 @ 11:59 to GradeScope

Directions:

Complete each of the questions. Partial credit is available. **This assignment can be done individually or pairs of 2 students**. If you do it in pairs, make sure to appropriately upload to Gradescope indicating who your team member is

Don't forget to properly associate your solutions with the questions on GradeScope.

All ER Diagrams should be in the Chen notation style.

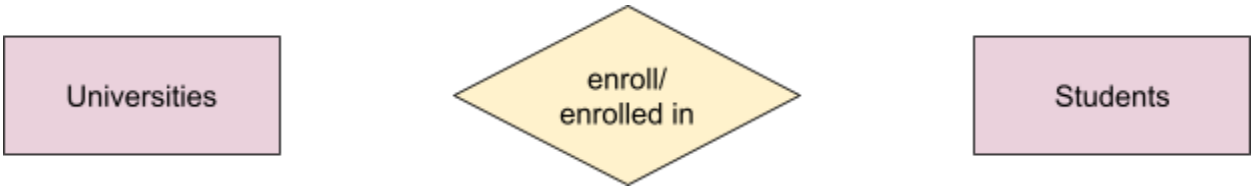
Academic Collaboration Reminder:

Remember that you may not look at, copy, capture, screenshot, or otherwise take possession of any other students' solutions to any of these questions except your partner should you choose to do this assignment in pairs. Further, you may not provide your solutions in part or in whole to any other student. Doing any of the above constitutes a violation of academic honesty which could result in an F in this class and a referral to OSCCR. What is permissible? You are free and encouraged to talk to your peers about the conceptual material from the lectures or the conceptual material that is part of this assignment. You can get a round a white board and talk through the Sakila data model. You and your colleagues can work through sample SQL queries done in class or others that you dream up on the fly. I'm very confident that each of you knows where the line between collaborative learning and cheating sits. Please don't cross that line.

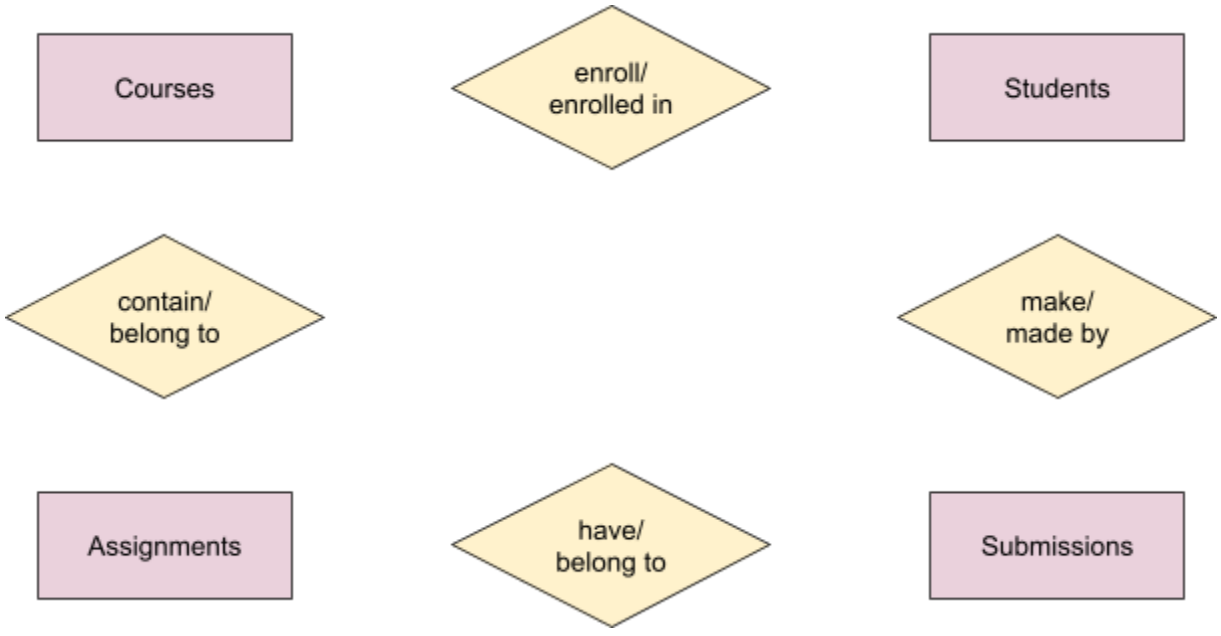
Question 1: ER Modelling

For the following questions, indicate the correct participation and cardinality by completing the ER Diagrams using the information provided. You may not change the entities or the relationships provided. [10 points each]

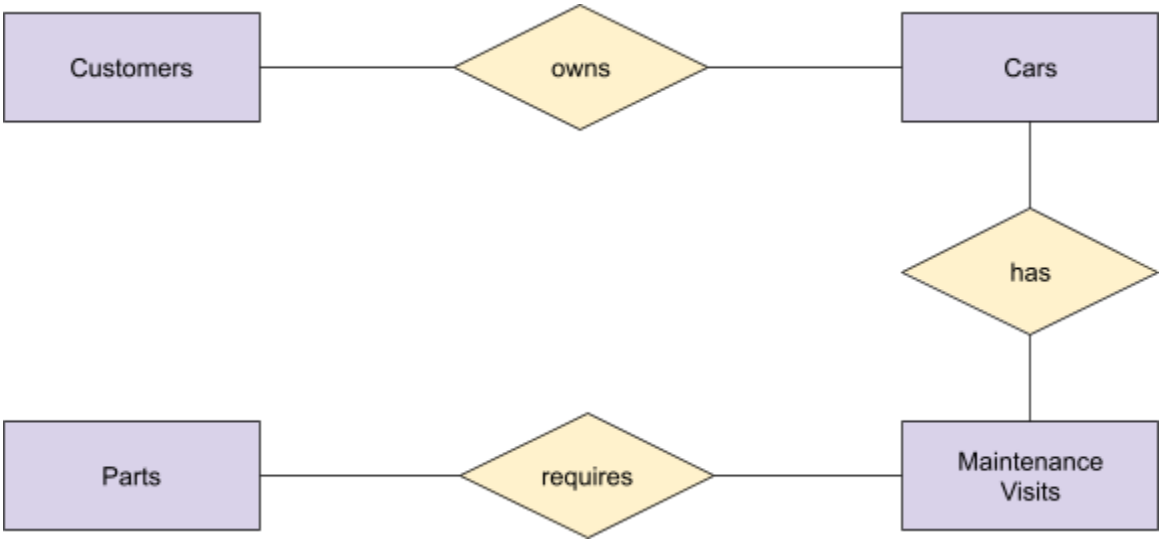
1.1 A university can accept several (but possibly 0) students. A student must be enrolled in exactly one university.



1.2 In a tool such as Gradescope that manages multiple courses, a course enrolls multiple students but may initially have no students enrolled. A student may be enrolled in multiple courses but doesn't have to be enrolled in any course that uses Gradescope. However, a student will only be enrolled in a particular class once. Each course must have at least one assignment, but may have many. However, each assignment is associated with exactly 1 course at all times. Students can submit solutions for assignments. If they do, they can only submit once, but they may not submit anything for a particular assignment.



Question 2:



Using the ER Diagram for a car dealership service center above as a starting point, use the narrative below to add additional detail. You will need to add additional entities + relationships, attributes, etc. Make sure to properly resolve any M:N relationships into appropriate 1:M relationships. Properly identify primary keys, any derived attributes, and appropriate multiplicities (cardinality and participation).

For each of the 4 bullet points below, choose a different color for each and perform any changes/updates/additions to the diagram using that color. The lines connecting entities and relationships can be colored or remain a dark color. The color coding will help us in grading which changes go with which bullet point. Put the color you choose for each bullet in the blanks provided below. (20 points per bullet)

… as told by the manager of the maintenance facility…

- *When a customer arrives, if they are a new customer, we need to gather their first name, last name, phone number, and email address. We use email addresses to uniquely identify each customer. Each customer must put one credit card on file for payment. In our system, we securely store the credit card number and expiration date of the card. Each credit card can be associated with one or more customer's accounts (think about a family sharing a single card). If a customer wants to update to a new card, the old card's info is deleted. But the new card stays associated with the same set of customers.* ***Color:*** _____
- *For cars, we track the make, the model, year of production, the VIN (vehicle identification number) which is unique to every car, and color of the car. Every maintenance visit is associated with a particular car. We keep track of the visitID (a unique value we assign to the maintenance visit), the date the car was dropped off for maintenance, the date we promised to return the car to the customer, the date we actually returned the car to the customer (which will initially be empty), and the mileage on the car when it was dropped off.* ***Color:*** _____
- *Each maintenance visit also has a technician assigned to it who performs all required maintenance on a particular car for a particular visit. Only one technician is assigned to a maintenance visit. On our side of*

the system, we only see the technician's first name, last name, and employee ID (which is unique to every employee), though. All the other employee info is handled by HR (you do not need to model the HR context). ***Color:*** _____

- *We stock a number of parts that are regularly used in maintenance visits. In the parts catalog, we store the SKU number (unique to each part, and every part has exactly 1) of the part, the name of the part, and any optional size information. OK… now let's say we order 5 oil filters to have in stock. When we receive them, we give each oil filter (or whatever the part is) a unique barcode number. Every barcode number is different among all the items we have ever stocked or currently stock. When a technician is going to use a part for a particular maintenance visit, they scan the barcode which changes the status of that individual part from 'available' to 'used'. We also store the date and time that the technician scanned the part for use. Every part in the catalog must come from at least one supplier, but may come from many suppliers. If we source a particular part from more than one supplier, each part will have a unique SKU. For each supplier, we store their name, a unique identifier we assign them, and the first name, last name, phone number and email of their sales representative. It is important to note that during one single maintenance visit, a technician may need multiple parts from the warehouse, but they may not need any parts at all.* ***Color:*** _____

Note: do NOT apply your own extensions to the specific description listed above. Simply model what has been communicated.

(Paste your diagram on the next page. You can paste it in landscape or portrait orientation.)

Paste your completed diagram here properly color coded: