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CSCI 4560-001
Homework 4
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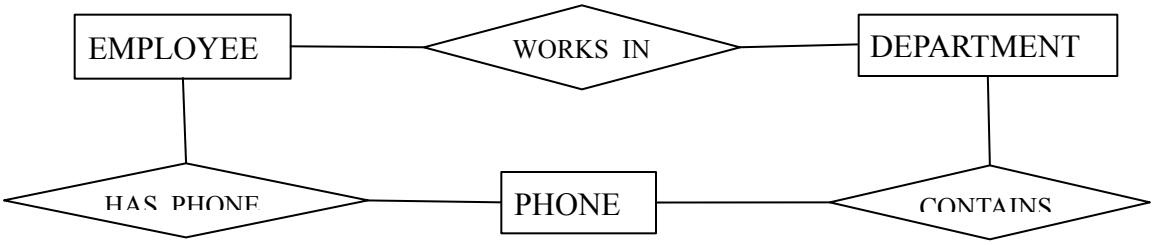
CSCI 4/5560: Database Management Systems
Assignment #4

Requirement: You **MUST** type your answer. Handwriting is not acceptable.
Submission: Print it and enclose the hardcopy in an envelope (at least 9"x12"), and put your name, instructor name on the envelope. (**Note**: Please do not seal envelope. You can use the same envelope for all your assignments.)

The following **3** questions are from textbook.

Page 237: question 7.24 (20 points)
Consider the ER diagram in Figure 7.22. Assume that an employee may work in up to two departments or may not be assigned to any department. Assume that each department must have one and may have up to three phone numbers. Supply (min, max) constraints on this diagram. State clearly any additional assumptions you make. Under what conditions would the relationship HAS_PHONE be redundant in this example?



Page 276: question 8.20 (60 points) use software. can replace this section with EER diagram of real world project

Design a database to keep track of information for an art museum. Assume that the following requirements were collected:

- The museum has a collection of ART_OBJECTS. Each ART_OBJECT has a unique Id_no, an Artist (if known), a Year (when it was created, if known), a Title, and a Description. The art objects are categorized in several ways, as discussed below.
- ART_OBJECTS are categorized based on their type. There are three main types: PAINTING, SCULPTURE, and STATUE, plus another type called OTHER to accommodate objects that do not fall into one of the three main types.
- A PAINTING has a Paint_type (oil, watercolor, etc.), material on which it is Drawn_on (paper, canvas, wood, etc.), and Style (modern, abstract, etc.).
- A SCULPTURE or a statue has a Material from which it was created (wood, stone, etc.), Height, Weight, and Style.
- An art object in the OTHER category has a Type (print, photo, etc.) and Style.
- ART_OBJECTs are categorized as either PERMANENT_COLLECTION (objects that are owned by the museum) and BORROWED. Information captured about objects in the PERMANENT_COLLECTION includes Date_acquired, Stats (one display, on loan, or stored), and Cost. Information captured about BORROWED objects includes the Collection from which it was borrowed, Date_borrowed, and Date_returned.
- Information describing the country or culture of Origin (Italian, Egyptian, American, Indian, and so forth) and Epoch (Renaissance, Modern, Ancient, and so forth) is captured for each ART_OBJECT.
- The museum keeps track of ARTIST information, if known: Name, DateBorn (if known), Date_died (if not living), Country_of_origin, Epoch, Main_style, and Description. The name is assumed to be unique.
- Different EXHIBITIONS occur, each having a Name, Start_date, and End_date. EXHIBITIONS are related to all the art objects that were on display during the exhibition.
- Information is kept on other COLLECTIONS with which the museum interacts, including Name (unique), Type (museum, personal, etc.), Description, Address, Phone, and current Contact_person.

Draw an EER schema diagram for this application. Discuss any assumptions you make, and that justify your EER design choices.

- **Page 279: question 8.23 (20 points)**

Consider the entity sets and attributes shown in the table below. Place a checkmark in one column in each row to indicate the relationship between the far left and right columns.(15 points)

a. The left side has a relationship with the right side.
b. The right side is an attribute of the left side.
c. The left side is a specialization of the right side.
d. The left side is a generalization of the right side.

	Entity Set	(a)Has a Relationship with	(b)Has an Attribute that is	(c)Is a Specialization of	(d)Is a Generalization of	Entity Set or Attribute
1	MOTHER			x		PERSON
2	DAUGHTER	x				MOTHER
3	STUDENT			x		PERSON
4	STUDENT		x			Student_id
5	SCHOOL	x				STUDENT
6	SCHOOL	x				CLASS_ROOM
7	ANIMAL				x	HORSE
8	HORSE		x			Breed
9	HORSE		x			Age
10	EMPLOYEE		x			SSN
11	FURNITURE				x	CHAIR
12	CHAIR		x			Weight
13	HUMAN				x	WOMAN
14	SOLDIER			x		PERSON
15	ENEMY_ COMBATANT			x		PERSON