Assignment 1

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CSE4020: Section 01

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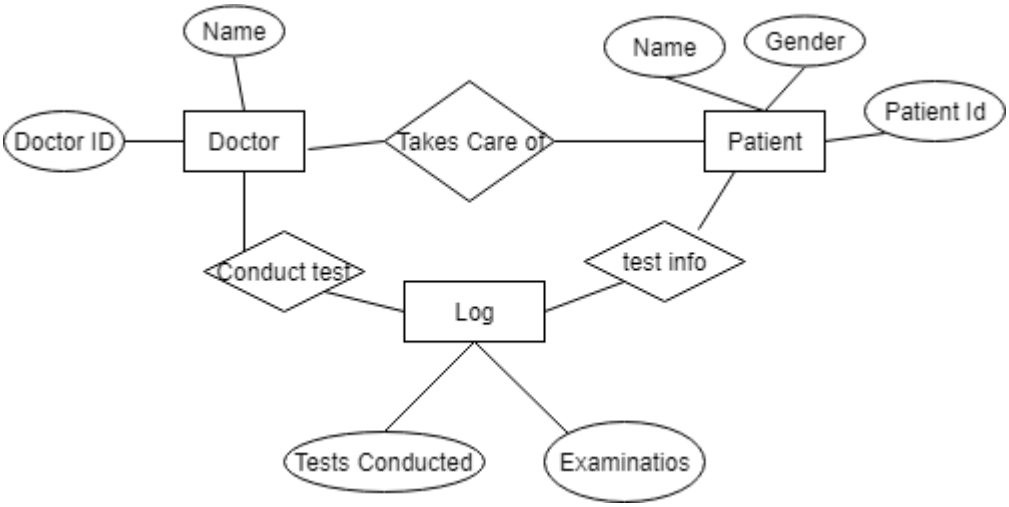
1 Explain the distinctions among the terms primary key, candidate key, and superkey. Give one example (not presented in class) that includes the three types

A primary key is one, or a set of attributes, that can uniquely define each entity in a set of entities. A candidate key is one, or a set of attributes that can qualify as a unique minimal key in the database. A primary key can be a candidate key. A superkey is any set of attributes that can uniquely identify a set of entities. a candidate key is a subset of a candidate key, and a superkey can technically be a primary key, although it is more ideal to make the primary key the same as the candidate key. This is, of course, up to the discretion of the designer.

2 Explain the difference between a weak and a strong entity set. We can convert any weak entity set to a strong entity set by simply adding appropriate attributes. Why, then, do we have weak entity sets?

A weak entity set is a is an entity set that that does not have sufficient attributes to form a primary key. A Strong entity key is an entity set that does have sufficient attributes to form a primary key. The reason why we use weak entity sets is useful because it is essentially an extension of a strong entity set, especially for data that is "optional" (similar to the car insurance example in class, where not every car gets into an accident)

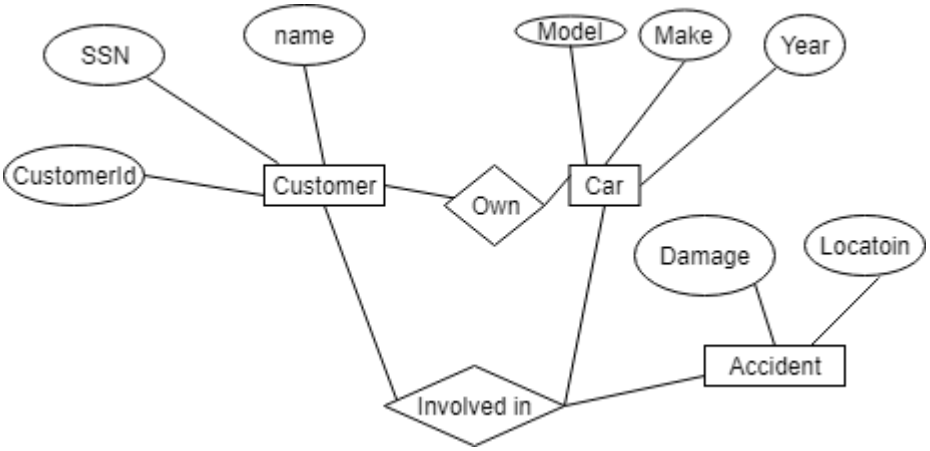
3 Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted.



4 Give a meaningful example of the need for role indicators in ER diagrams. (Don't give a diagram, just an example in words. Also, don't use the example presented in class)

Role indicators are used to help describe a relationship that may be between multiple entities in the same entity set. A good example of this is with employees. A company will have managers and workers. A worker needs to report to a manger, who is also an employee, and thus role indicator's can express this more easily.

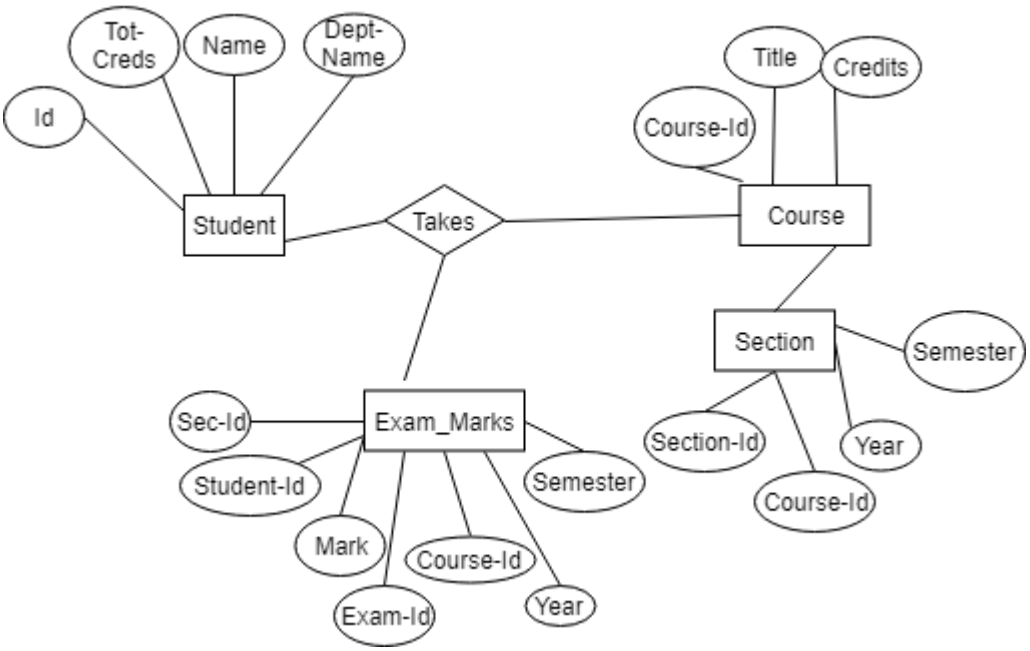
5 Construct an ER diagram for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. Then, convert the E-R diagram into a set of relational schemas.



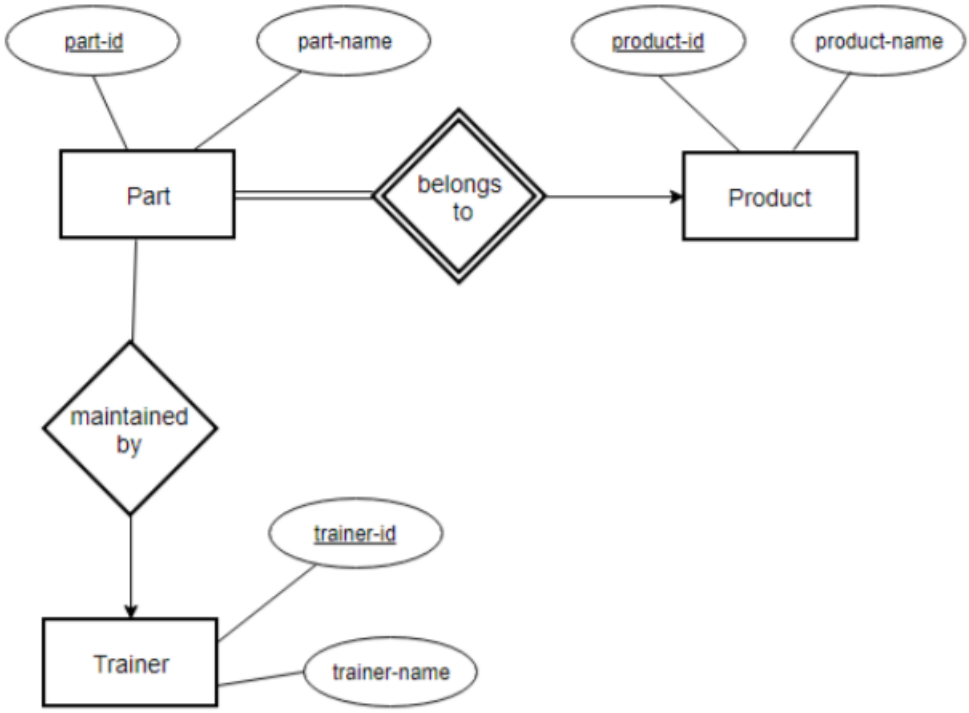
Schemas:
Customers(CustomerId, SSN, name)
Vehicle(Make, Model, Year)
Accident(Damage, Location)

6 Construct appropriate E-R diagrams for the following relation schemas.

student (ID, name, dept-name, tot-cred)
course (course-id, title, credits)
section(course-id, section id, semester, year)
exam_marks (student-id, course-id, sec-id, semester, year, exam-id, mark)


Tot-
Creds
Name
Dept-
Name
Id
Student
Takes
Course
Title
Credits
Course-Id
Section
Semester
Sec-Id
Exam_Marks
Section-Id
Year
Student-Id
Semester
Course-Id
Mark
Course-Id
Exam-Id
Year

7 Construct appropriate relation schemas for the following E-R diagrams.



Schemas:
Part(part-id, part-name)
Trainer(trainer-id, trainer-name)
Product(product-id, product-name)