CEE 412/ CET 522 Transportation Data Management and Visualization

Assignment 2 | Winter 2020

CEE 412 students will have a total possible score of 50 points from questions 1-4 and CET 522 students will have a total possible score of 60 from questions 1-5.

If you are asked to make a database design, be sure to explain any unusual aspects of your design, and any assumptions you have made that relate to your design.

1. Make a Legend of E/R Diagram symbols. List ALL of the symbols and discuss their meanings in practical terms. [10 Points]

2. Design a database for a bank (Create an E/R diagram), that can be used to maintain and update customer information and their respective account information. [10 Points]

   Some requirements:

   - Your database should at least represent the following information.

     Customers: Name, Address, Phone, SSN

     Accounts: AccountNumber, AccountType [savings, checking, etc.], Balance

     Employees: Name, EmployeeID, Position, Salary

     Relationships: Customers and Accounts; Accounts and Employees

   - Include other entities, attributes, and relationships if you think they are useful.

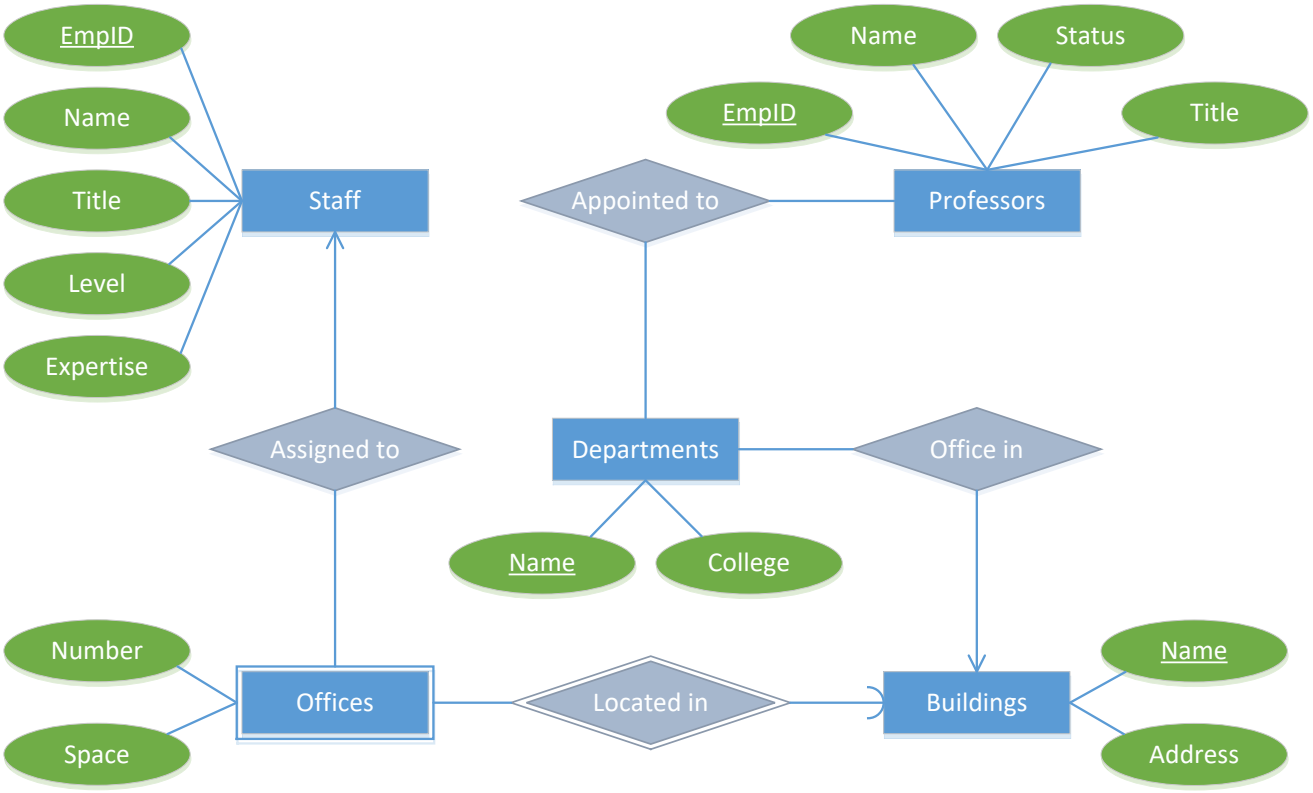
3. We want to build a database to manage information about university employees (both professors and staff), office assignments, and both employee and department office locations. Below is an E/R diagram for this database. Here are the assumptions I made in developing this ER diagram:

   a. Each person can only be assigned to a single office, but each office may house more than one person.

   b. A professor/staff can be appointed to one or more departments but may be assigned to an office in any building.

   c. Each building can house more than one department, but each department can only reside in one building.

   d. The same office number may appear in multiple buildings.



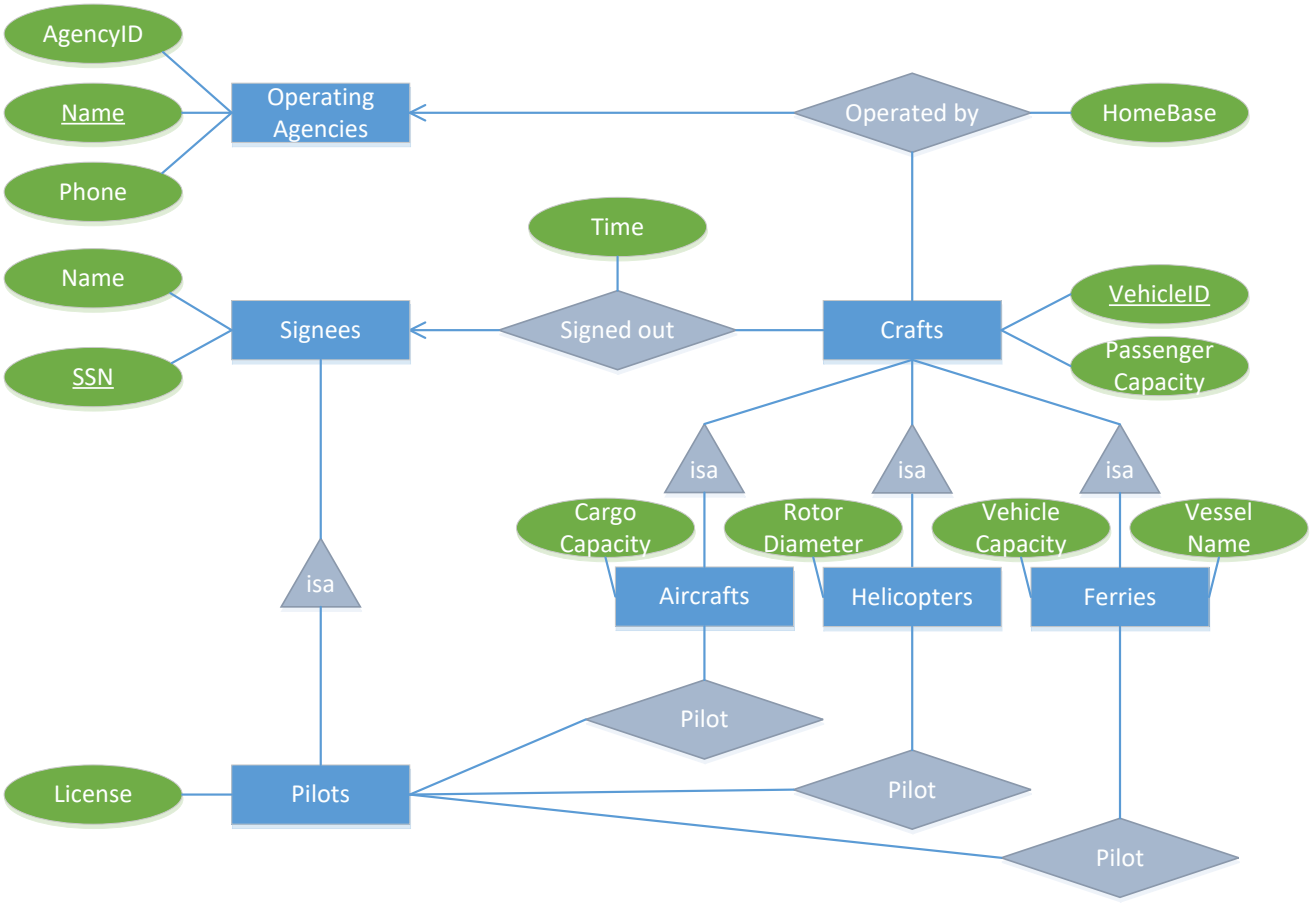
Answer the following questions: [15 Points]

1) Have my assumptions been correctly represented in this diagram? Please explain for each assumption listed above.

2) List any other issues you have identified from the E/R diagram.

3) How would you change the design (create an E/R diagram of your solution, it may be significantly different from the given diagram)?

4. Convert the following E/R diagram to a relational database schema. Remember to underline the key for each relation. Justify your conversion if necessary. [15 points]



5. (Grad students only) Given the relational schema below, construct the E/R diagram. [10 Points]

Cabinets (Name, Route, Milepost)

Loops (LoopID, Cabinets.Name, Type)

HOVLoops (Loops.LoopID, HOVType, Agency)

LoopData (Loops.LoopID, Timestamp, Volume, Occupancy, Flags)