Homework 3 Part A: Design and ER Diagram

Construct an ER diagram (no inheritance/specialization/generalization) that would be capable of modeling information that is kept in Peoplesoft for students. Model an ER diagram that is capable of keeping track of students’ class schedule, shopping cart, plan of study, and transcripts. In order to support this, consider the following set of requirements (may not be complete) that are adapted from Exercise 7.16 in textbook.

a. The university keeps track of each student’s name, peoplesoft number, netID, Social Security number, current address and phone number, permanent address and phone number, preferred email, secondary email, birth date, sex, class (freshman, sophomore, ..., graduate), major department, minor department, department (if any), and degree program (B.A., B.S., ..., Ph.D.). Some UConn applications need to refer to the city, state, and ZIP Code of the student’s permanent address and to the student’s last name. Both Social Security number and peoplesoft number have unique values for each student.

b. Each department is described by a name, department code (U Box number at UConn), office number, office phone number, address, and college (e.g., engineering, business, nursing, etc). Both name and code have unique values for each department.

c. Each course has a course department (CSE, ECE, MATH, etc.), course number, course name, course description, credits, level (undergrad, grad, etc.), an a list of zero or more prerequisite courses. The value of the course number is unique for each course.

d. Each section of a course has an instructor, semester, year, course, and section number. The section number distinguishes sections of the same course that are taught during the same semester/year; its values are 1, 2, 3, ..., up to the number of sections taught during each semester.

e. A grade report has a student, section, letter grade, and numeric grade (0, 1, 2, 3, or 4). Note that you need to consider how to combine c, d, and e into a transcript.

f. Ability to store a planned schedule (via a shopping cart) that would eventually transition to entities that store the transcript after course registration (e.g., once you register for Spring 2016 this fall, it shows up in your generated transcript as planned courses). Since the schedule could stay in the cart for period of time, you need to store that info in the DB until registration occurs. Think about the entities and relationships that would be required to support this.

g. Ability to support the registration process – specifically, what is the possible approach to supporting the wait list? Think about the entities and relationships that would be required to support this.

h. Ability to support the plan of study that had to record not only courses that have been taken (already completed or in progress) but choices for the remaining requirements to be completed. Think about the entities and relationships that would be required to support this.

Design an ER schema for this application, and draw an ER diagram for the schema. Specify key attributes of each entity type, and structural constraints on each relationship type. Note any unspecified requirements, and make appropriate assumptions to make the specification complete.

While MySQL Workbench does allow the design of ER diagrams, there is no symbol for a relationship (diamond in and ER diagram) and it is difficult to label the relationship with cardinalities (1, n, m, etc.). It is recommended that you utilize the PPT for Part B (next page). This image is an embedded PPT that you can edit by Right Click – Presentation Object – Open – that will open powerpoint so you can save as a PPT to modify and change. For Part A – upload a PPT titled: PartA_lastname_firstname.pptx.
Homework 3 Part B: EER to relational Conversion Algorithm

Convert the following EER Diagram to a set of relational tables utilizing the conversion algorithm from Chapter 9. A description of the content of the diagram for the ABC Pharmacy includes:

- Tracking information on Patients (name, address, SSN, etc.), Physicians (name, specialty, DEA#, etc.), and Drug Companies (name, phone number, web site). May have multiple phones. Address composite.
- Tracking information on each Drug (name, price, status (generic, brand), drug companies that sell the drug, etc.).
- Each patient has a primary physician, and also each patient have a collection of physicians that can prescribe them drugs.
- Physician’s prescribe drugs for patients, can prescribe multiple drugs per patient, can prescribe to multiple patients, etc. Likewise, multiple physicians can prescribe the same or different drugs to the same patient. Each Prescription has a date, refills, DEA#, dosage (assume milligrams), pattern (1perday, 2perday, etc.), and fill requirement (brand or generic).
- The ABC Pharmacy has different purchasing contracts with each Drug Company. These contracts allow ABC to purchase the same drugs from different Companies. The contract has a start date, end date, and a quantity (in number of bottles).

Clearly identify each Step in the algorithm process (see the Chapter 9 PPTs). For Part B – upload a word doc titled: PartB_lastname_firstname.docx.