Database Systems – Summer 2019

Assignment 3 ER Diagrams Total: 100 Points

Note: It is very important that every submission you do in this course is your original work. I will be running your submission through multiple plagiarism checkers. It not only checks online sources but also other previous submissions on the blackboard.

Q1. (50 points)

Consider the following set of requirements for a UNIVERSITY database that is used to keep track of students' transcripts.

(a) The university keeps track of each student's name, student number, social security number, current address and phone, permanent address and phone, birthdate, sex, class (freshman, sophomore, ..., graduate), major department, minor department (if any), and degree program (B.A., B.S., ..., Ph.D.). Some user applications need to refer to the city, state, and zip of the student's permanent address, and to the student's last name. Both social security number and student number have unique values for each student.

(b) Each department is described by a name, department code, office number, office phone, and college. Both name and code have unique values for each department.

(c) Each course has a course name, description, course number, number of semester hours, level, and offering department. The value of course number is unique for each course.

(d) Each section has an instructor, semester, year, course, and section number. The section number distinguishes different 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, 4 for F, D, C, B, A, respectively).

Design an ER schema diagram for this application, you are free to make reasonable assumptions but make sure to clearly state any and all assumptions you make. Label the diagram using (min, max) as you have learned in the lectures.

Q2. (50 points)

Problem statement:

A database is being constructed to keep track of the teams and games of a sports league. A team has a number of players, not all of whom participate in each game. It is desired to keep track of the players participating in each game for each team, the positions they played in that game, and the result of the game. The injuries of the players and the team management is also a big part of any league, make sure to include that as well. Start with identifying the entities, their attributes and then the relationship between different entities. Design an ER schema diagram for this application, you are free to make reasonable assumptions but make sure to clearly state any and all assumptions you make. Label the diagram using (min, max) as you have learned in the lectures. Choose your favorite sport (e.g., soccer, baseball, football). **You are required to cover all aspects of the game you chose to be reflected in your ER.**

The text below is for a simple demonstration not to be used in your solutions:

A very basic example for the above problem would be: the NHL has many teams, each team has a name, a city, a coach, a captain, and a set of players, each player belongs to only one team, each player has a name, a position (such as left wing or goalie), a skill level, and a set of injury records, a team captain is also a player, a game is played between two teams (referred to as host_team and guest_team) and has a date (such as May 11th, 1999) and a score (such as 4 to 2). Construct a clean and concise ER diagram for the NHL database.