Databases – Relational Model

Petko Rutesic

WWI-18-DSA/WWI-18-DSB

DHBW
Duale Hochschule
Baden-Württemberg
Mannheim

Exercises 2

9. December 2019

1 ER-diagram

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

- The university keeps track of each student's name, student number, Social Security number, current address and phone number, permanent address and phone number, birth date, sex, class (freshman, sophomore, ..., graduate), major department, minor department (if any), and degree program
- Some user 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 student number have unique values for each student.
- Each department is described by a name, department code, office number, office phone number, and college. Both name and code have unique values for each department.
- Each course has a course name, description, course number, number of semester hours, level, and offering department. The value of the course number is unique for each course. Additionally, each course can have one or more prerequisite courses.
- Each section 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.
- A grade report has a student, section, letter grade, and numeric grade (1, 2, 3, 4).
- The university keeps track of the instructor's Social Security number, instructor's name, current address and phone number.

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.

2 ER-diagram to relational model

Convert your ER- diagram from question 1) into relations. You should include primary key and foreign key constraints.

3 ER-diagrams in Data Modeling tools

Build the ER schema for the database from question 1 using a data modeling tool such as MySQLWorkbench.