DHBW
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Exercises 2

8. December 2022

1 ER-diagram

Consider the following set of requirements for a university database that is used to store data of students, courses, students' transcripts, etc.

- 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) and degree program. Each student has exactly one major department and can have zero or more minor departments.

- Some university 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 (student ID) have unique values for each student.

- Each department is described by its 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 course section has an instructor, semester, year, course, and section number. The section number distinguishes sections of a single course that are taught during one semester/year; its values are 1, 2, 3, ..., up to the number of sections taught during the corresponding 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 conceptual schema for this application by drawing an ER diagram using Chen notation. 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 in task 1. into relational data model. You should include primary key, foreign keys and other constraints.

3 ER-diagrams in Data Modeling tools

Build an ER schema of database specified in task 1. using a data modeling tool such as pgAdmin 4 or MySQLWorkbench.