COMP 5112. Lab 10: E-R Diagrams

Question 1.

1.1

Draw an ER diagram that captures the following specification.
A company database needs to store information about employees (identified by *ssn*, with *salary* and *phone* as attributes); departments (identified by *dno*, with *dname* and *budget* as attributes); and children of employees (with *name* and *age* as attributes). Employees work in departments; each department is managed by an employee; a child must be identified uniquely by name when the parent (who is an employee; assume that only one parent works for the company) is known. We are not interested in information about a child once the parent leaves the company.

1.2

Explain to another student nearby why your ER diagram for the exercise 1.1 is correct – in the sense that it captures all the requirements in the exercise.

1.3

Find out the primary key of each entity set, relationship set in your ER diagram. Then, discuss with student nearby whether your primary keys are correct (with respect to your ER diagram).

1.4

Convert your ER diagram of the exercise 1.1 into relational schemas. Then, draw the schema diagram of your relational schemas.

Question 2.

A university database contains information about professors (identified by social security number, or *ssn*) and courses (identified by course-id, or *cid*). Professors teach courses; each of the following situations concerns the *Teaches* relationship set.

For each of the following situation, draw an ER diagram that describes it (assuming that no further constraints hold).

A. Professors can teach the same course in several semesters, and each offering must be recorded.

B. Professors can teach the same course in several semesters, and only the most recent such offering needs to be recorded. (Assume this condition applies in all subsequent questions.)

C. Every professor must teach some course.

D. Every professor teaches exactly one course (no more, no less).

E. Every professor teaches exactly one course (no more, no less), and every course must be taught by some professor.

F. Now suppose that certain courses can be taught by a team of professors jointly. Model this situation, introducing additional entity sets and relationship sets if necessary.