Today: Relational Design Theory. §§ 3.1–3.3.
Next class: Decomposition, normal forms. §§ 3.4–3.5.
Reminders: Homework. Midterm exam. Newsgroup. Syllabus. Reading.

1. List the members of your group below. Underline your name.

2. Refer to our running example of a student-course-enrollment database. Provide, with brief explanation, the smallest possible instance of the `Students` relation that *violates* the functional dependency `id`→`name`, `year`.

3. Provide, with brief explanation, the smallest possible instance of the `Courses` relation that *violates* both the functional dependencies `id`→`title` and `ta`, `title`→`id`.

4. Provide simple English descriptions of the dependencies in Questions 2 and 3.

5. List *all* superkeys and *all* keys of `Courses`, given the dependencies in Question 3.

6. Compute $\{\texttt{title}\}^+$ and $\{\texttt{id}, \texttt{ta}\}^+$ given the dependencies of Question 3.

7. Consider $R(A, B, C, D, E)$ with dependencies

$$\begin{array}{rcl} AB & \rightarrow & C \\ BC & \rightarrow & A \\ D & \rightarrow & E \\ CE & \rightarrow & B \end{array}$$

List all keys of R

8. Project the dependencies of Question 7 onto the relation $R'(A, B, C)$.

9. Decompose R as necessary to generate a BCNF schema. For each decomposition used, clearly indicate the dependency used and the relations before and after the decomposition. List the projected dependencies for each decomposed relation.