

# LBSC 690: Information Technology

## Homework 05:

### Structured Data and Databases

*Updated version, 29th Feb; clarify many-to-many*

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Your task in this homework is to draw up a design for a database of children's (digital or digitized) drawings at a local school. Having talked to the teachers organizing the project, you have identified the following requirements:

- The digital drawings will be uploaded to a server external to the database, and referred to in the database by URL.
- For each drawing, the database must record the title of drawing, the date it was drawn, which student drew it, and what class they were in when they drew it.
- For each student, the database must record the student's given (first) name, family (last) name, and a list of all the classes the student is in.
- For each class, the database must record the name of the class (e.g. "Art", "Geography"), the year level of the class, and the name of the class teacher.<sup>1</sup>
- A drawing is drawn by only one student, but a student can draw many drawings.
- A student can belong to many classes, and each class can have many students.
- A drawing can be drawn in only one class, but each class can have many drawings made in it.

Draw up your design for the database as an Entity-Relationship Diagram. The diagram should show what fields are in each entity. Primary keys and foreign keys should be shown. The cardinality of relations should be shown. Many-to-many relationships must be resolved into paired one-to-many relationships with a linking table (similar to

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<sup>1</sup>Possible Australianism: a "class" is a subject-specific instructional grouping of students that recurs at weekly intervals, and possibly on multiple occasions in the one week; students move from class to class during the school day.

“enrolments” in the example in the lecture slides). Diagrams may be drawn up using any tool you like. As a last resort, they may be (neatly) hand-drawn, scanned, and emailed to me, or handed to me in hard copy at the start of class. (If you use a tool that produces a different form of ERD than the one shown in the lecture notes, please indicate what the symbols of your diagram mean.)