Introduction to Database Design

DS 501 Database Systems

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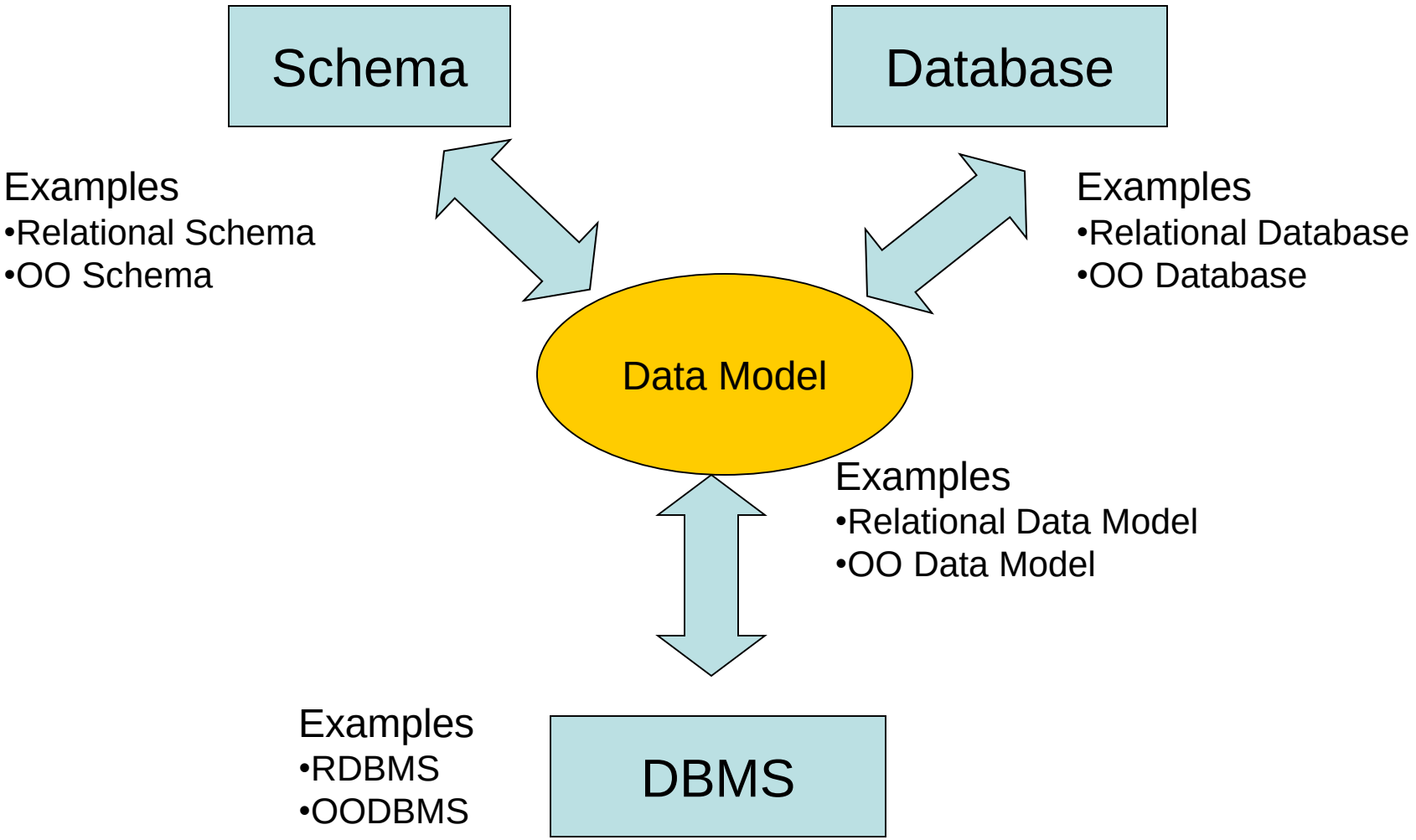
Outline

- The coupling between data model, schema, database and DBMS
- The database design process

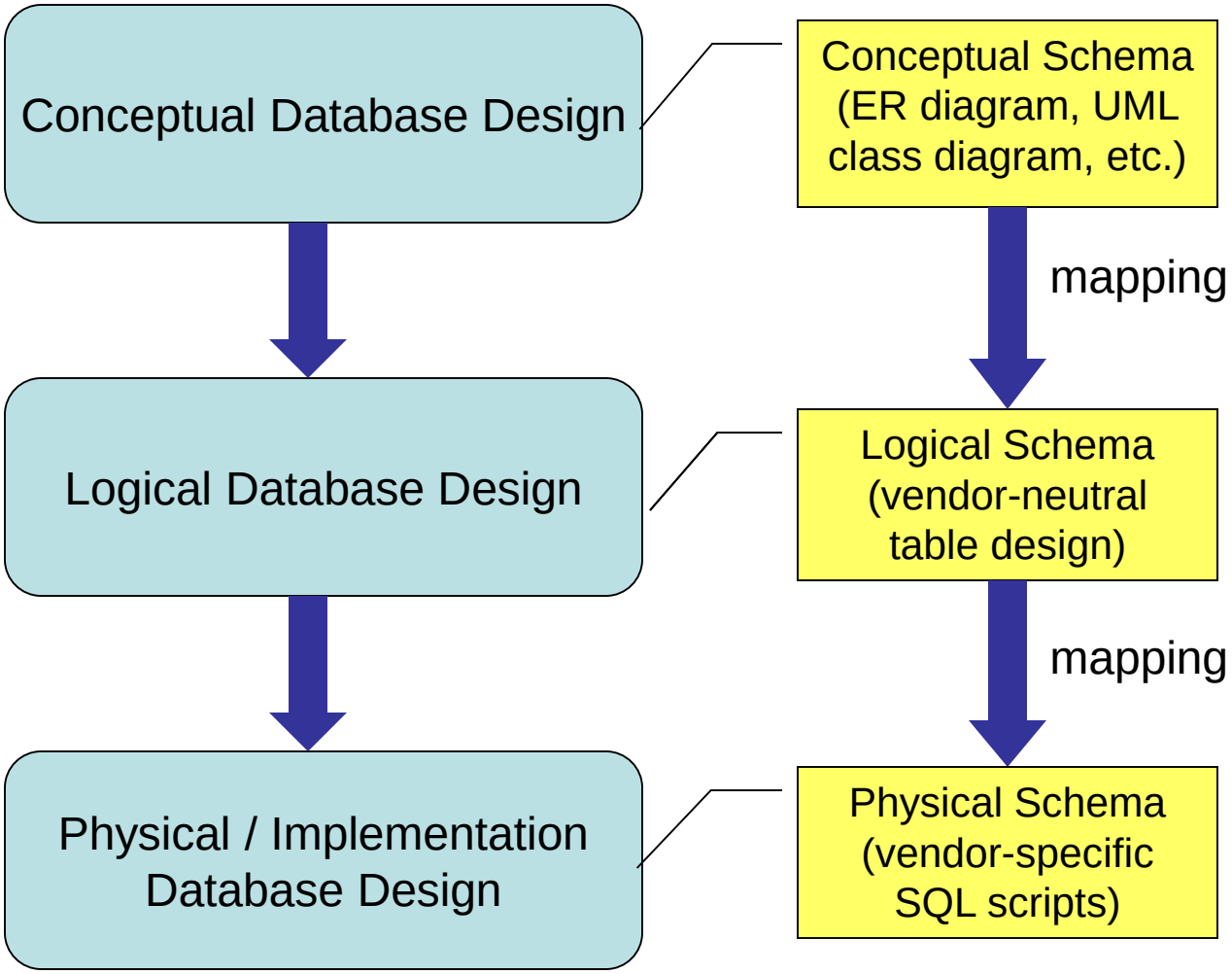
Data model binds them all



Relational Database Design

- Goal is to create a design that can be implemented using a RDBMS
- The design is basically comprised of a collection of tables
- There are two ways in which the set of tables for a database can be identified:
  1. Design through conceptual modeling
  2. Design through normalization

Design through conceptual modeling



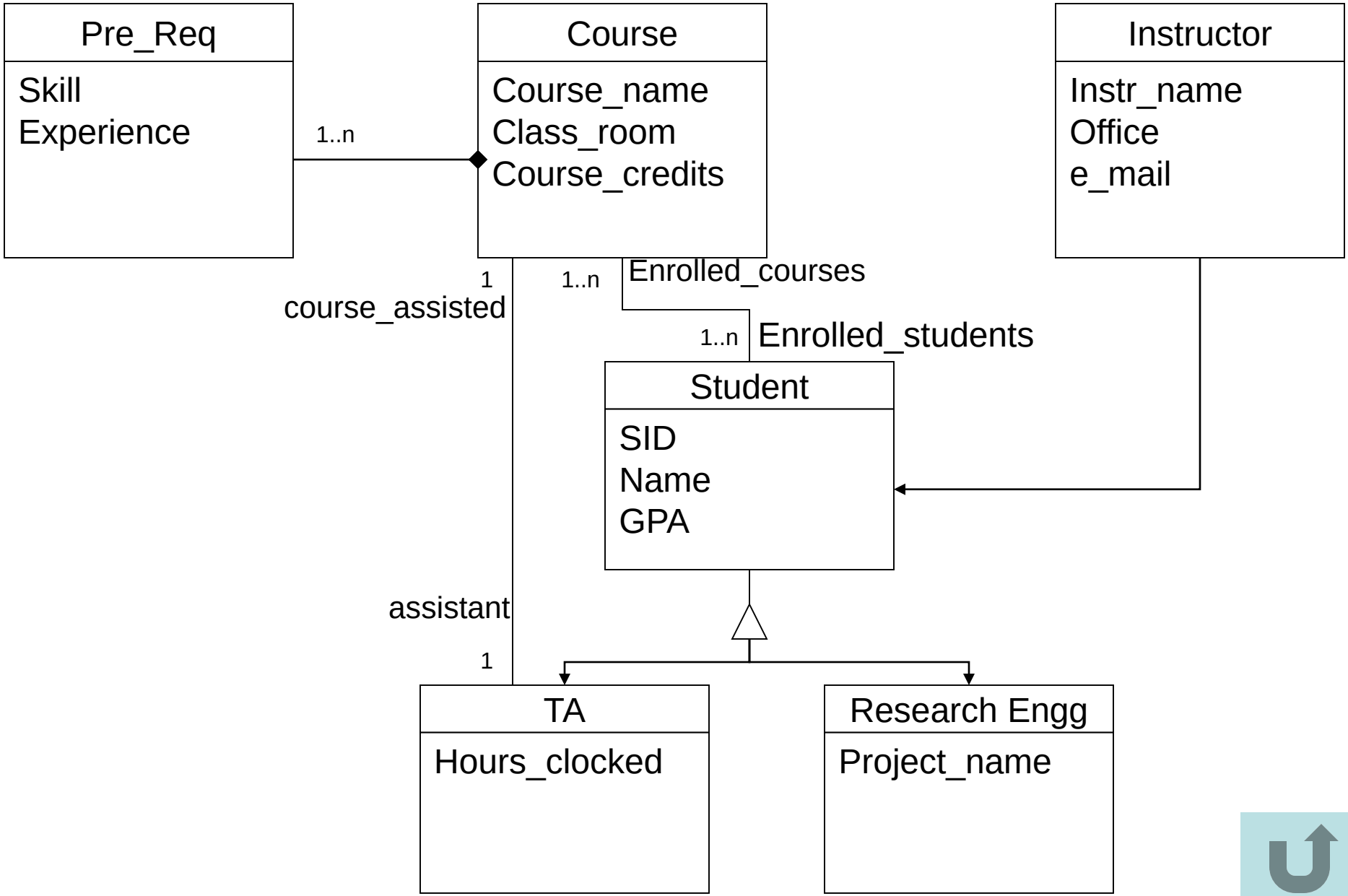
Why Conceptual Design

- Relational database designs can be very hard to communicate
- Errors can be hard to detect
- Conceptual designs are usually expressed in pictures (and pictures are worth a hundred words here)

Are there errors in this design?

 Course.java	 Instructor.java	 PreRequisite.java
 ResearchEngg.java	 Student.java	 TeachingAssistant.java

Are there errors in this design?



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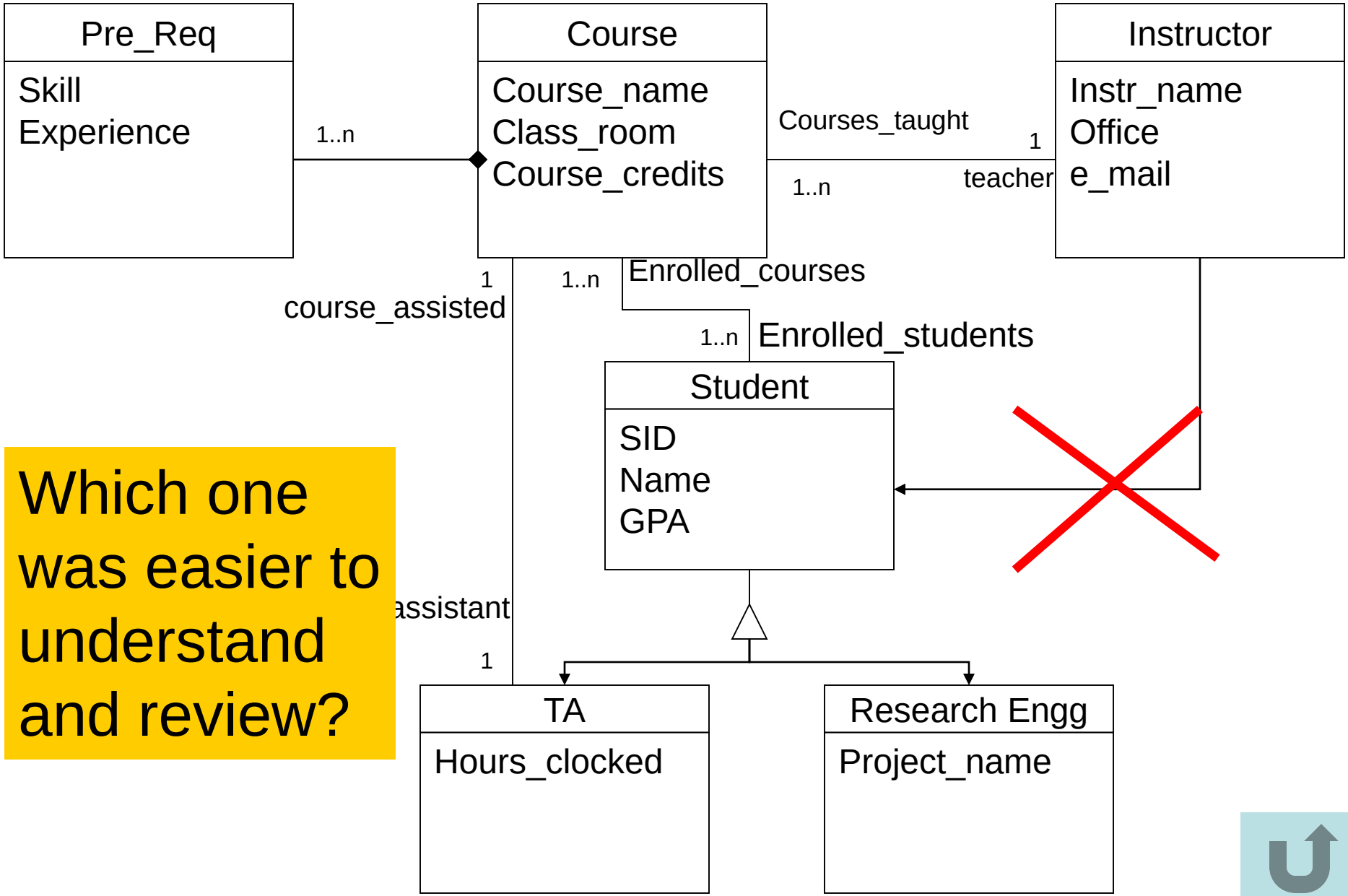

Which one was easier to understand and review?

Conceptual Design

- Uses diagrams to communicate information about data and relationships
- Helps make "implicit" information "explicit"
- Recall that data models are vocabularies
- Conceptual data models help create conceptual database designs
- ER and UML are examples conceptual data models

So what?

Design through normalization