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**COP 4710**

ER Exercise 1 (Ch. 4)

1. Automobile, college class, and a student can be represented as entities because they are a generalization of a concept which can be further described. Conversely, the name of a student, a book’s title, or a number of dependents describe states an entity could be in. They describe an entity, such that a Student entity has a name, a Book has a title, and a Person has some number of dependents.
2. Attributes are data that describe a larger, more general entity. For example, I am a Person and my first name “Zachary” is an attribute of mine. Attributes from problem #1 include name of student, book title, and number of dependents.
3. A relationship is a connection between two entities — a way the two are related or connected in some fashion. For example, imagine you have two entities Vehicle and Person. An instance of Person may drive a vehicle and thus is related to the instance of Vehicle which he drives. Perhaps the Person has an attribute called “vehicle” which is a relational reference to the instance of Vehicle which he owns/drives.
4. ER diagram is on following page.
5. The superintendent’s name may or may not be a composite attribute. It depends on the user and the developers based on the function that is needed. If an attribute has many sub-attributes it might be more organized and easier to deal with by collapsing them into a composite attribute.
6. ER Diagram is on following page.
7. Multivalued attributes are mapped as separate tables, with each row of this table containing a reference back to the parent table. The attribute is not listed on the original table: accessing the associated attributes is done by querying the separate table for rows which reference the original table.
8. Composite attributes on a table are mapped as fields/columns on the table for all the atomic, subattributes of the composite attribute. As such, a name might be represented on a table as the following columns: name\_first, name\_middle, name\_last.
9. A unique identifier is an attribute on an Entity which can be used to uniquely differentiate an instance of the Entity from other instances. A “primary” key is designated as **the** way to reference a particular instance, and other keys being considered during planning for the role of primary are referred to as “candidate keys”.
10. This problem is contained on the final page.

Building

**Problem #10**

Book

Books(Title, Publisher)

Author(Book, last\_name)

Course(Book, course\_name)

***The Entity***

This database records data about *Books*. For each *Book* in the database we record *Title*, *Publisher*, *Course*, and *Author*.

***The Attributes***

For each *Book*, there will be one and only one *Title*. The value of *Title* will not be subdivided.

For each *Book*, there will be one and only one *Publisher*. The value of *Publisher* will not be subdivided.

For each *Book*, we will record *Course*. There may be more than one *Course* for each *Book*.

For each *Book*, we will record *Author*. There may be more than one *Author* for each *Book*.

***The Keys***

For each *Book*, we will have the following primary key: *Title*.