Assignment: Small-Scale E-R ⇒ RDB Mapping

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1 Assignment-Specific Packaging

The general packaging is unchanged from the basic "Homework Requirements" (see slides from first lecture and "Homework Policies for COM 3563" on Piazza).

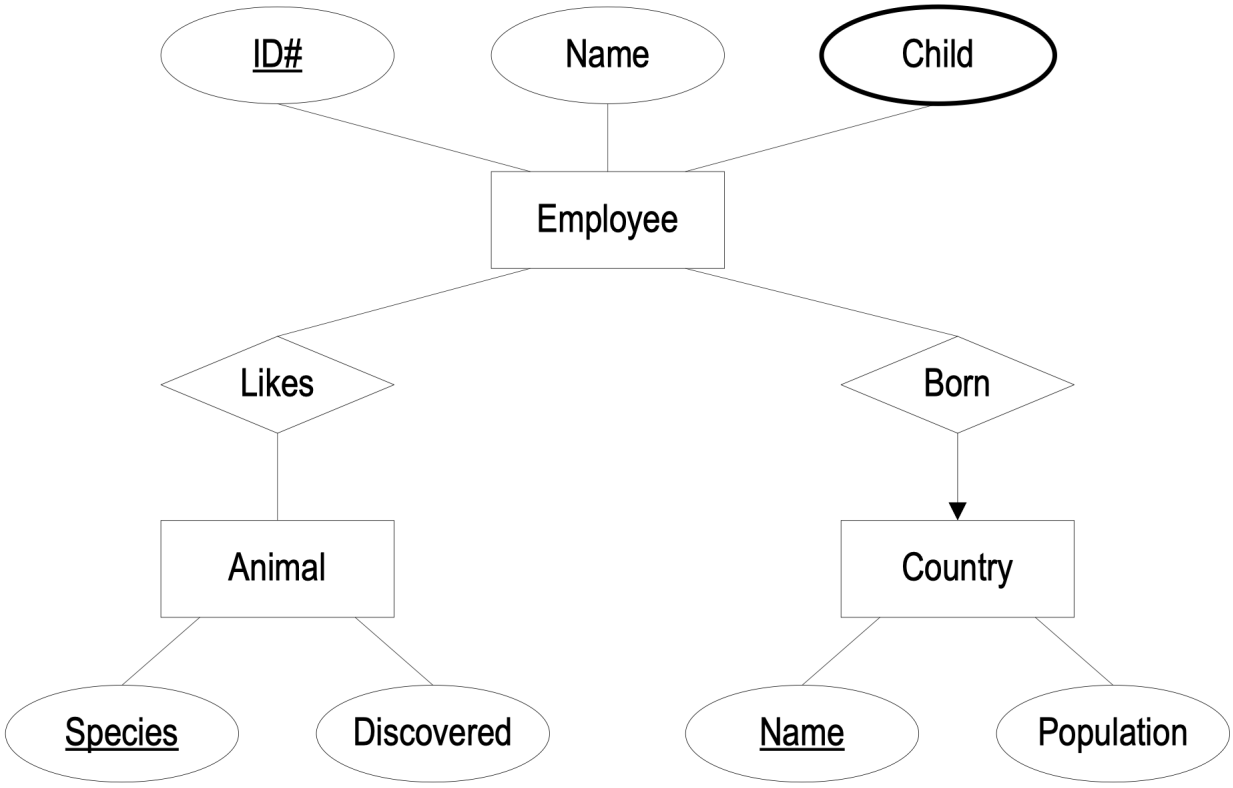
This assignment's "DIR" **must be named** *ER2*. Your report **must be named** *$DIR/ER2.pdf*.

2 Motivation & Background

The purpose of this assignment is to have you walk-through ("by hand", not using a commercial tool) the set of issues that are involved in an "E-R ⇒ RDB" mapping. You will start with small-scale, *somewhat contrived* E-R diagram (provided below), and transform the diagram into a set of RDB schema.

The RDB schema that you'll create will be "pictures" (see below): no need to take the extra steps to provide the DDL.

2.1 The E-R Diagram



The E-R diagram is mostly self-explanatory, some explanation below:

- The *Discovered* attribute is "the continent in which a particular animal species was first discovered"
- The only information we have about a "child" is their name: they have no "identity" of their own, and are therefore represented as an *attribute*.
- You can assume that no **primary key** attribute values are missing
- Non-primary-key attributes may have missing values
  - Except for *employee name* which is also guaranteed not to be missing

2.2 Supplying Some Data

To make the RDB aspect more explicit, you will use the following data to populate the *entity instances*.

5 Employees:

- ID 1, Alice, children are Erica and Frank, born in US, likes Horse and Cat
- ID 2, Bob, children are Bob and Frank, born in US, likes Cat
- ID 4, Carol
- ID 5, David, born in IN
- ID 6, Bob, children is Frank, born in CN, likes Yak

4 Countries:

- US (missing)
- IN has 1347 million people
- CN has 1412 million people
- RU (missing)

4 Animals:

- Horse discovered in Asia
- Wolf discovered in Asia
- Cat discovered in Africa
- Yak discovered in Asia
- Zebra discovered in Africa

3 Requirements

You will be creating a set of RDB table **diagrams** to represent the entity sets and relationship sets depicted in the E-R diagram above. Use any tool that you want to draw a table, and format the table in any way that you choose, so long as:

- The table is "very readable"
- Your choices of names for attribute names "map" easily to the E-R diagram
- You create a column for each attribute, and populate the table with the data supplied above
- You underline the attributes of the *primary key*
- Annotate your table with appropriate *foreign key* constraints
- When mapping a relationship to tables, be sure to indicate the *cardinality* and *direction* of the relationship.

You may:

- Create as many tables as you choose.
- Indicate that an attribute value is NULL by leaving the table cell empty.

> I suggest that you review the textbook and lecture "rules" for a E-R $\Rightarrow$ RDB mapping before beginning the assignment. There are often multiple ways to do the same thing in this type of work, but I will deduct points if your mapping is violates any of the rules that we've discussed.

The following mapping of the country entity set is an example of what I want:

Country	Cname	Population
	US	
	IN	1347
	CN	1412
	RU	

3.1 Step 1: Animal

Create a table for the animal schema (this should be trivial, see the rendering of country above).

3.2 Step 2: Employee

Create a table for the employee schema: this is less trivial than animal.

3.3 Step 3: Born

Implement the born relationship.

3.4 Step 4: Likes

Implement the likes relationship.