Complementing Database Design for Microsoft Access with MySQL Workbench

Jerzy Letkowski, Ph.D.

Professor of Decision & Information Sciences

College of Business

Western New England University

Outline

- Database Creation

- General Database Design Process

- Access Database Design Process

- Filling the Gap

- Discussion

Database Creation [1]

Microsoft

"When you create a database, you gather tables together into one collection and gain the benefit of data dictionary features. To collect tables into a database, you need to create a database container to hold all of the objects such as views, connections, and stored procedures associated with the tables that make up your database."

MySQL

"Create a database, create tables, load data into the tables."

Wikipedia

"Database design is the process of producing a detailed data model of database. This data model contains all the needed logical and physical design choices and physical storage parameters needed to generate a design in a data definition language, which can then be used to create a database."

Database Creation [2]

Microsoft Access

In order to create an "empty" database, create a new Access file, for example:
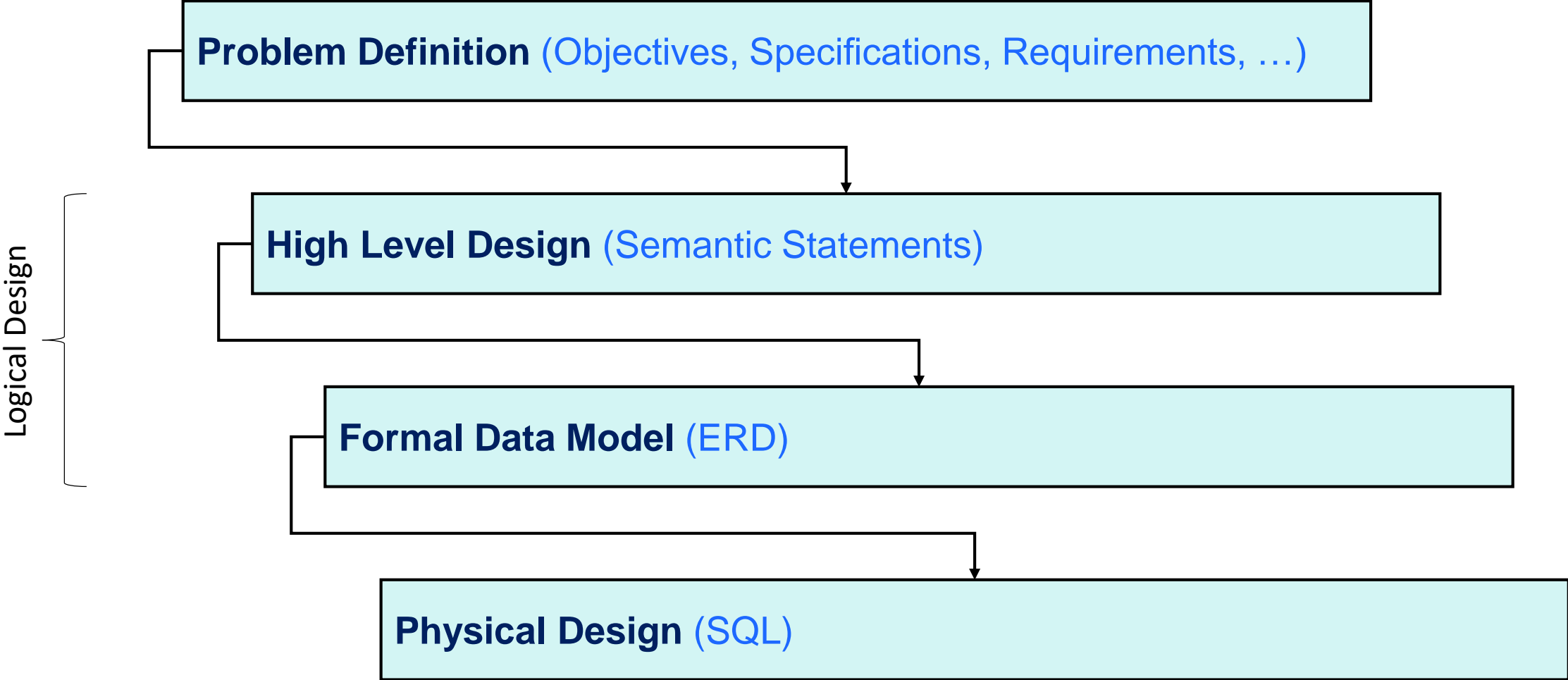`HDB.accdb`.

MySQL

In order to create an "empty" database, connect to a MySQL server and execute one of the following commands:

`CREATE DATABASE HDB;`
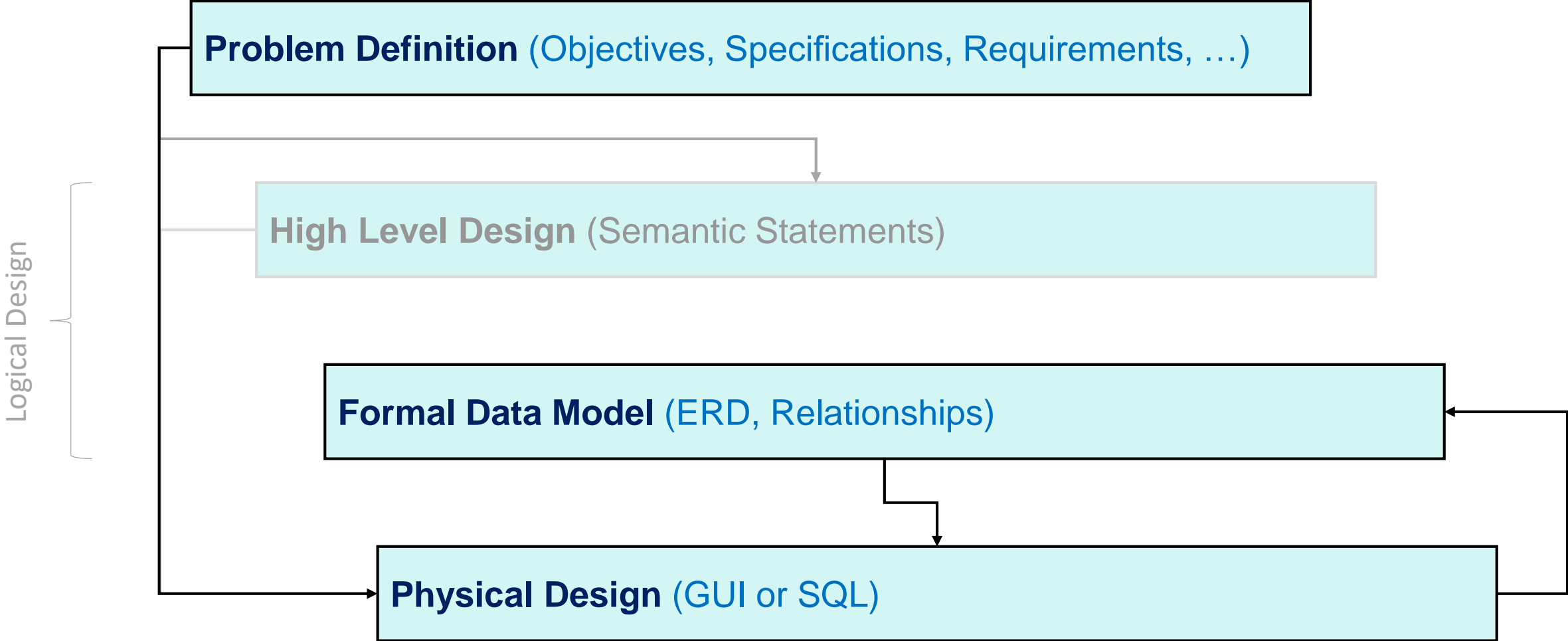
or

`CREATE SCHEMA HDB;`

General Database Design Process

Problem Definition (Objectives, Specifications, Requirements, …)

High Level Design (Semantic Statements)

Formal Data Model (ERD)

Physical Design (SQL)

Logical Design

Access Database Design Process

Problem Definition (Objectives, Specifications, Requirements, …)

High Level Design (Semantic Statements)

Logical Design

Formal Data Model (ERD, Relationships)

Physical Design (GUI or SQL)

Filling the Gap [1]

Problem Definition (Objectives, Specifications, Requirements, …)

Nick is a Web developer, who wants to run a Web site, **hobbysta.org**, specializing in sharing information among hobby enthusiasts all over the World.

Filling the Gap [2]

High Level Design (Semantic Statements)

Let use names Member and Hobby to represent collections of members and hobbies, respectively. At the initial (or high) level of the database design process, we refer to such names as entities or classes. Thus we have entity Member, a set of member records, and entity Hobby, a set of hobby records.
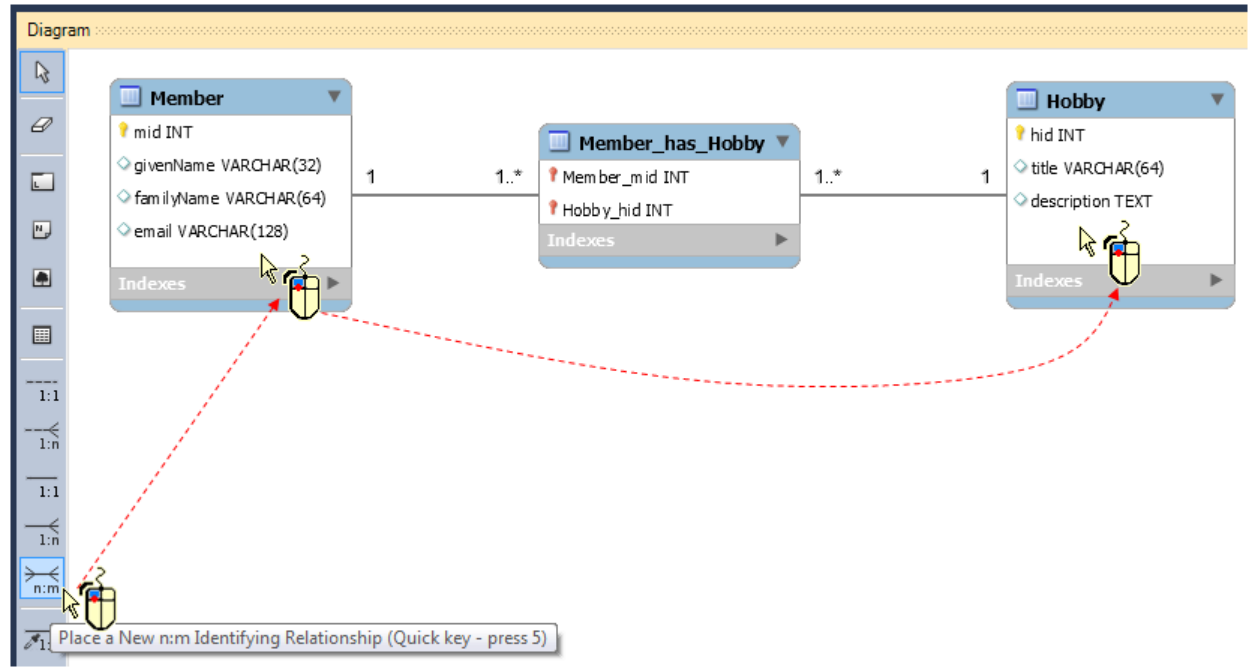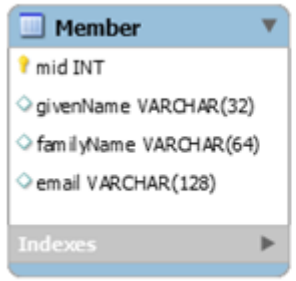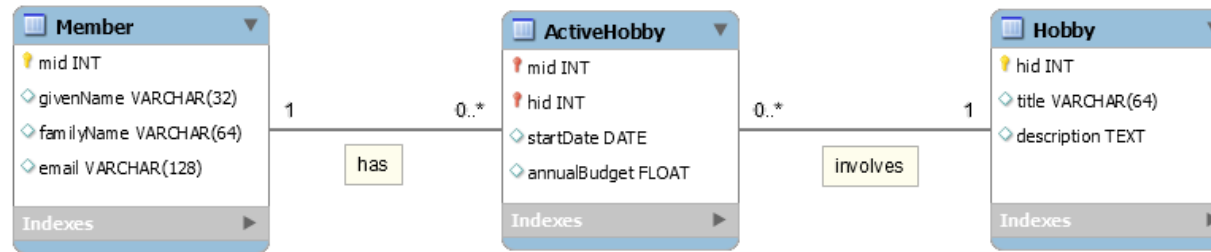
Member(0..*) - *has* - (0..*)Hobby
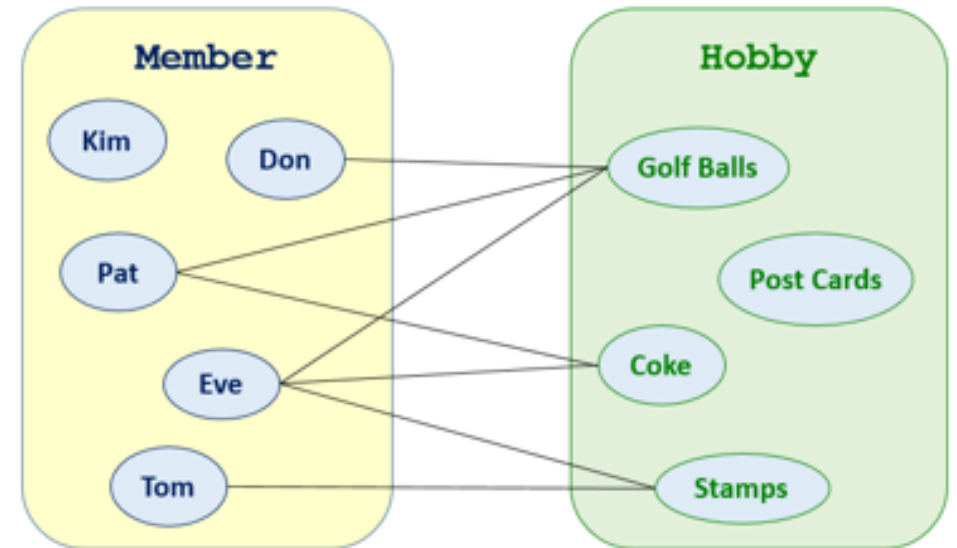
Filling the Gap [3]

Formal Data Model (ERD/UML in MySQL Workbench)
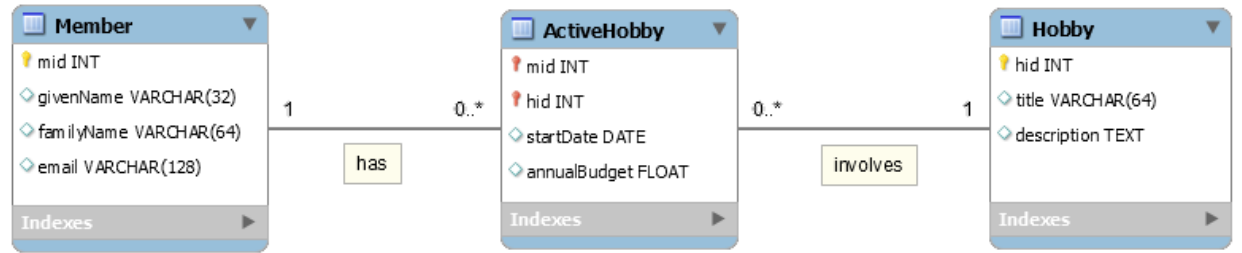
Filling the Gap [4]

FORWARD ENGINEERING

```
CREATE TABLE Member (
  mid INT NOT NULL,
  givenName VARCHAR(32) NULL,
  familyName VARCHAR(64) NULL,
  email VARCHAR(128) NULL,
  PRIMARY KEY (mid)
);
```
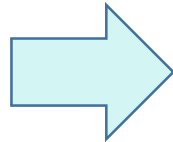
```
CREATE TABLE Hobby (
  hid INT NOT NULL,
  title VARCHAR(64) NULL,
  description TEXT NULL,
  PRIMARY KEY (hid)
);
```

```
CREATE TABLE ActiveHobby (
  mid INT NOT NULL,
  hid INT NOT NULL,
  startDate DATE NULL,
  annualBudget FLOAT NULL,
  PRIMARY KEY (mid, hid),
  FOREIGN KEY (mid) REFERENCES Member (mid),
  FOREIGN KEY (hid) REFERENCES Hobby (hid)
);
```

Filling the Gap [4a]

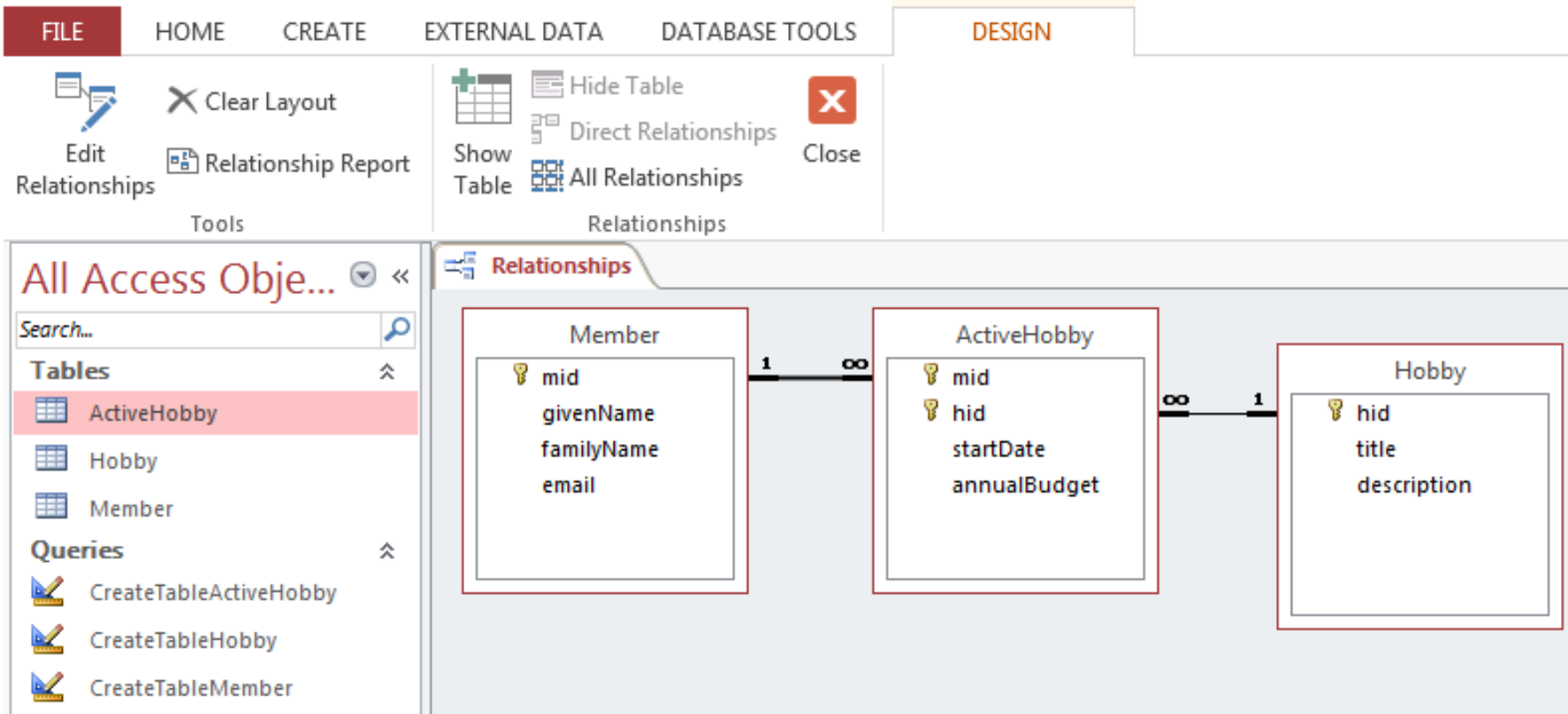**Physical Design** (Create Tables in Access)

```
CREATE TABLE Member (
  mid INT NOT NULL,
  givenName VARCHAR(32) NULL,
  familyName VARCHAR(64) NULL,
  email VARCHAR(128) NULL,
  PRIMARY KEY (mid)
);
```

Filling the Gap [5]

Formal Data Model (Access Relationships Done)

Discussion

- Access is not capable of implementing the complete database design process (SDLC).

- MySQL and MySQL Workbench are free and very resourceful. MySQL Workbench supports the full SDLC (including the forward and reverse software engineering). It also supports simple forms but does not have report generators.

- Is it really important for business students to learn [more] about the logical database design?

- If so, how?

- Is an "average" business graduate more likely to participate in database design or in database application development projects in his/her careers?

- Does ability to perform the logical DB design help in better understanding how businesses operate?

- Is ability to write simple queries, develop forms and/or reports more important?

- . . .