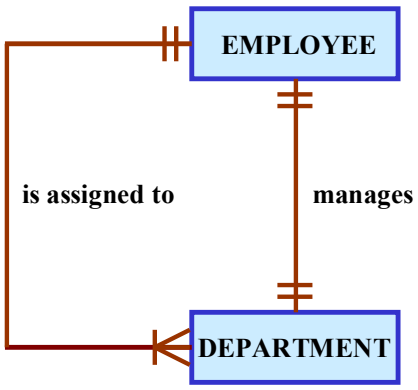
Chapter 2

Create a Crow's Foot ERD for each of the following descriptions. (*Note*: The word *many* merely means "more than one" in the database modeling environment.)

1. **Each of the MegaCo Corporation's divisions is composed of many departments. Each of those departments has many employees assigned to it, but each employee works for only one department. Each department is managed by one employee, and each of those managers can manage only one department at a time.**

   The Crow's Foot ERD is shown in Figure P2.16a.

FIGURE P2.16a The MegaCo Crow's Foot ERD



As you discuss the contents of Figure P2.16a, note the 1:1 relationship between the EMPLOYEE and the DEPARTMENT in the "manages" relationship and the 1:M relationship between the DEPARTMENT and the EMPLOYEE in the "is assigned to" relationship.

2. **During some period of time, a customer can download many ebooks from BooksOnline. Each of the ebooks can be downloaded by many customers during that period of time.**

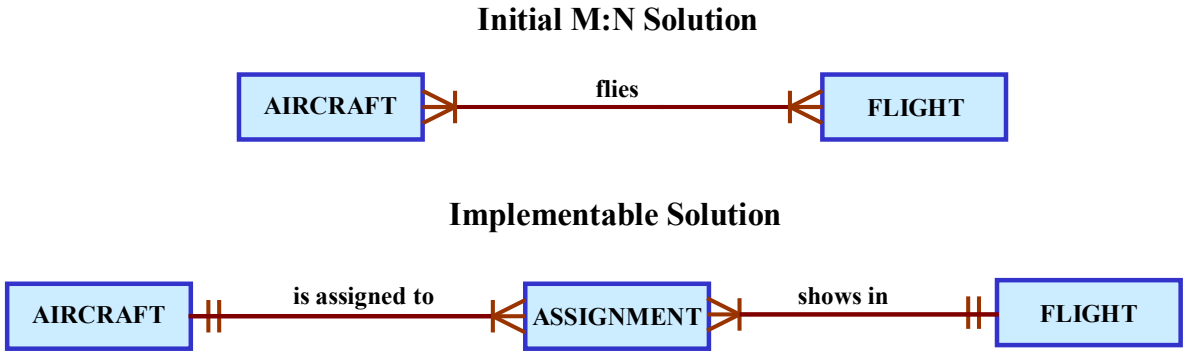
The solution is presented in Figure P2.16b. Note the M:N relationship between CUSTOMER and EBOOK. Such a relationship is not implementable in a relational model.

FIGURE P2.16b The BigVid Crow's Foot ERD

If you want to let the students convert Figure P2.16b's ERD into an implementable ERD, add a third DOWNLOAD entity to create a 1:M relationship between CUSTOMER and DOWNLOAD and a 1:M relationship between EBOOK and DOWNLOAD. (Note that such a conversion has been shown in the next problem solution.)

3. **An airliner can be assigned to fly many flights, but each flight is flown by only one airliner.**

FIGURE P2.16c The Airline Crow's Foot ERD



We have created a small **Ch02_Airline** database to let you explore the implementation of the model. (Check the data files available for Instructors at www.cengagebrain.com.) The tables and the relational diagram are shown in the following two figures.

FIGURE P2.16c The Airline Database Tables

Database name: Ch02_Airline

Table name: AIRCRAFT

AC_NUM	AC_MODEL
123U	MD-80
375G	B-737
411H	B-737

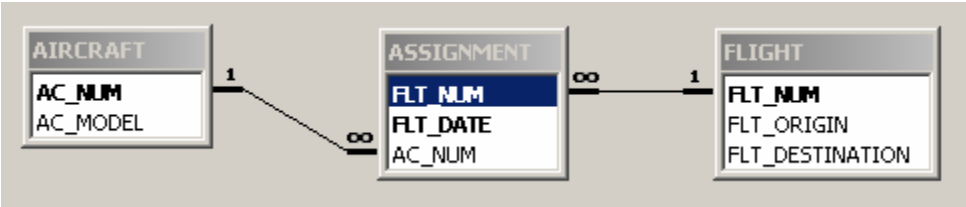
Table name: ASSIGNMENT

FLT_NUM	FLT_DATE	AC_NUM
101	14-Jan-16	375G
101	15-Jan-16	375G
101	16-Jan-16	411H
101	17-Jan-16	375G
101	18-Jan-16	123U
102	14-Jan-16	375G
102	15-Jan-16	375G
102	16-Jan-16	411H
102	17-Jan-16	375G
102	18-Jan-16	123U

Table name: FLIGHT

FLT_NUM	FLT_ORIGIN	FLT_DESTINATION
101	MEM	ATL
102	ATL	MEM

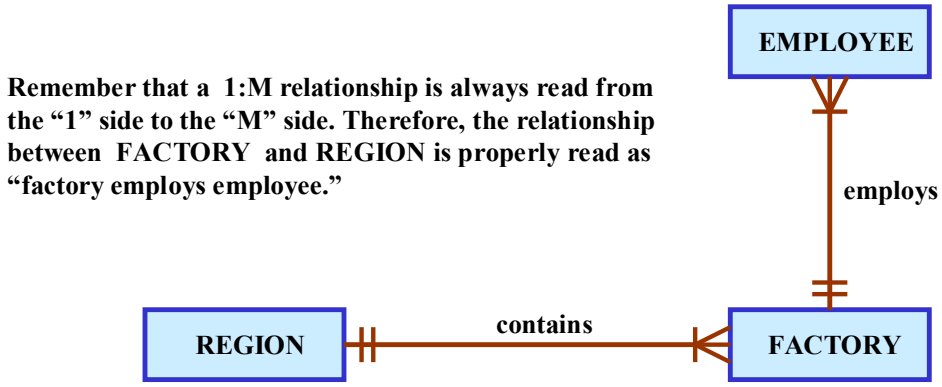
FIGURE P2.16c The Airline Relational Diagram



4. **The KwikTite Corporation operates many factories. Each factory is located in a region. Each region can be "home" to many of KwikTite's factories. Each factory employs many employees, but each of those employees is employed by only one factory.**

The solution is shown in Figure P2.16d.

FIGURE P2.16d The KwikTite Crow's Foot ERD



5. **An employee may have earned many degrees, and each degree may have been earned by many employees.**

The solution is shown in Figure P2.16e.

FIGURE P2.16e The Earned Degree Crow's Foot ERD

Note that this M:N relationship must be broken up into two 1:M relationships before it can be implemented in a relational database. Use the Airline ERD's decomposition in Figure P2.16c as the focal point in your discussion.