James River Jewelry wants to expand its database applications beyond the recording of purchases and purchase awards. (See the description of the award program in the *James River Jewelry Project Questions for Chapter 1* in this Appendix.) The company still wants to maintain data on customers, purchases, and awards, but it wants to include other data as well. Specifically, James River Jewelry wants to record artists and styles and keep track of which customers are interested in which artists and styles.

James River Jewelry sells most of its jewelry on consignment, so the company does not pay the artist of a piece of jewelry until it is sold. Typically, the company pays artists 60 percent of the sales price, but the terms are negotiated separately for each item. For some items, the artists earn a larger percentage and for others they earn less. Artists and James River Jewelry personnel agree on the initial sales price at the time the item is brought to the shop. When an item has been in the shop for some time, James River Jewelry may reduce the price; sometimes it renegotiates the sales percentage.

A. Draw an E-R data model for the James River Jewelry database schema shown in the *James River Jewelry Project Questions for Chapter 3* in this Appendix. Use the IE Crow's Foot E-R model for your E-R diagrams. Justify the decisions you make regarding minimum and maximum cardinality.

B. Extend and modify the E-R data model to show James River Jewelry's award program. Use the IE Crow's Foot E-R model for your E-R diagrams. Create appropriate identifiers and attributes for each entity. Justify the decisions you make regarding minimum and maximum cardinality.

C. Extend and modify the E-R data model in part B to meet James River Jewelry's new requirements. Use the IE Crow's Foot E-R model for your E-R diagrams. Create appropriate identifiers and attributes for each entity. Justify the decisions you make regarding minimum and maximum cardinality.

**Case Study 1**

James River Jewelry is a small jewelry shop. While James River Jewelry does sell typical jewelry purchased from jewelry vendors, including such items as rings, necklaces, earrings, and watches, it specializes in hard-to-find Asian jewelry. Although some Asian jewelry is manufactured jewelry purchased from vendors in the same manner as the standard jewelry is obtained, many of the Asian jewelry pieces are often unique single items purchased directly from the artisan who created the piece (the term “manufactured” would be an inappropriate description of these pieces). It has a small but loyal clientele, and it wants to further increase customer loyalty by creating a frequent buyer program. In this program, after every 10 purchases, a customer will receive a credit equal to 50 percent of the average of his or her 10 most recent purchases. This credit must be applied to the next (or “11th”) purchase.

Create an ER diagram of customers and purchases and a second list of customers and credits. Your lists should include customer data you think would be important to James River, along with typical purchase data. Credit data should include the date of the credit, the total amount of the 10 purchases used as the basis of the credit, and the credit amount. You should also create appropriate ID columns.

**Case Study 2**

James River Jewelry wants to expand its database applications beyond the recording of purchases and purchase awards. (See the description of the award program in Case Study 1.) The company still wants to maintain data on customers, purchases, and awards, but it wants to include other data as well.

Specifically, James River Jewelry wants to record artists and styles and keep track of which customers are interested in which artists and styles.

James River Jewelry sells most of its jewelry on consignment, so the company does not pay the artist of a piece of jewelry until it is sold. Typically, the company pays artists 60 percent of the sales price, but the terms are negotiated separately for each item. For some items, the artists earn a larger percentage and for others they earn less. Artists and James River Jewelry personnel agree on the initial sales price at the time the item is brought to the shop. When an item has been in the shop for some time, James River Jewelry may reduce the price; sometimes it renegotiates the sales percentage.

Extend and modify the E-R data model from Case study 1 to meet James River Jewelry's new requirements. Use the IE Crow's Foot E-R model for your E-R diagrams. Create appropriate identifiers and attributes for each entity.