Information and Computer Science Department
Spring Semester 072
ICS 324 – Database Systems
Enhanced Entity Relationship Model Exercises

Objectives

The objective of this lab is to draw an Enhanced Entity Relationship (ER) diagram from a given specification (or problem statement)

Outcomes

After completing this Lab, students are expected to:

- Be able to draw manually an EER diagram from a given specification (or problem statement).
- Be able to draw an EER diagram using TOAD Data Modeler.

Lab Exercises

1. Consider an *online auction* database system in which members (buyers and sellers) participate in the sale of items. The data requirements for this system are summarized as follows:

   • The online site has members who are identified by a unique member id and are described by an email address, their name, a password, their home address, and a phone number.

   • A member may be a buyer or a seller. A buyer has a shipping address recorded in the database. A seller has a bank account number and routing number recorded in the database.

   • Items are placed by a seller for sale and are identified by a unique item number assigned by the system. Items are also described by an item title, an item description, a starting bid price, bidding increment, the start date of the auction, and the end date of the auction.

   • Items are also categorized based on a fixed classification hierarchy (for example a modem may be classified as /COMPUTER/HARDWARE/MODEM).

   • Buyers make bids for items they are interested in. A bidding price and time of bid placement is recorded. The person at the end of the auction with the highest bid price is declared the winner and a transaction between the buyer and the seller may proceed soon after.

   • Buyers and sellers may place feedback ratings on the purchase or sale of an item. The feedback contains a rating between 1 and 10 and a comment. Note that the ratings are placed on a completed transaction by the buyer or seller of the item in the transaction.

   Design an Entity-Relationship diagram for the auction database and enter the design using a data modeling tool such as TOAD.

2. Consider a database system for a baseball organization such as the major leagues. The data requirements are summarized as follows:

   • The personnel involved in the league include players, coaches, managers, and umpires. Each is identified by a unique personnel id. They are also described by their first and last names along with the date and place of birth.

   • Players are further described by other attributes such as their batting orientation (left, right, or switch) and have a lifetime batting average (BA).

- Within the players group is a subset of players called pitchers. Pitchers have a life time ERA (earned run average) associated with them.

- Teams are uniquely identified by their names. Teams are also described by the city in which they are located and the division and league in which they play (such as Central division of the American league).

- Teams have one manager, a number of coaches, and a number of players.

- Games are played between two teams with one designated as the home team and the other the visiting team on a particular date. The score (runs, hits, and errors) are recorded for each team. The team with more number of runs is declared the winner of the game.

- With each finished game, a winning pitcher and a losing pitcher are recorded. In case there is a save awarded, the save pitcher is also recorded.

- With each finished game, the number of hits (singles, doubles, triples, and home runs) obtained by each player is also recorded.

Design an Entity-Relationship diagram for the baseball database and enter the design using a data modeling tool such as TOAD.