1.6 Describe the purpose of a database.

The purpose of a database is to help people keep track of things.

1.7 What is a modification problem? What are the three possible types of modification problems?

A modification problem is a data corruption or unintended data loss that occurs when a table uses one row to store facts about two or more themes. In this case, a deletion of a row can remove facts about two or more themes, leading to a loss in data, or a data change must be made in multiple rows to maintain data consistency. Finally, unless creation of a new row is allowed based on only one theme, it may be impossible to store needed data.

Thus, the three possible modification problems are: (1) insert problems—missing data, (2) update problems—inconsistent data, and (3) delete problems—data loss.

1.8 Figure 1-35 shows a list that is used by a veterinary office. Describe three modification problems that are likely to occur when using this list.

Updating an owner’s name or other data must be done in (potentially) many rows

Possibly incorrect, inconsistent owner data across rows (changed in one row, but not in another)

No place to store owner (your customer!) data unless they have a pet

1.9 Name the two themes in the list in Figure 1-35.

OWNER and PET

1.10 What is an ID column?

An ID column is a column used to assign a unique identifying number to each row of a table.

1.11 Break the list in Figure 1-35 into two tables, each with data for a single theme. Assume that owners have a unique phone number but that pets have no unique column. Create an ID column for pets like the one created for customers and courses for the Art Course database tables in Figure 1-12.

**PET (PetID, PetName, PetType, PetBreed, PetDOB, *OwnerPhone*)**

**OWNER (OwnerLastName, OwnerFirstName, OwnerPhone, OwnerEmail)**

1.12 Show how the tables you created for question 1.11 solve the problems you described in question 1.8.

* We have to change owner data just once for each owner.
* We allow only one row per owner, so we can’t have inconsistent data.
* We can add owner data, even if the owner has no pet.

1.13 What does SQL stand for, and what purpose does it serve?

SQL stands for **Structured Query Language**. It is used for combining, querying, and processing sets of tables and the data in those tables. For example, an SQL statement could be used to recombine the two tables created in question 1.8 into a table containing the data shown in Figure 1-34.

1.14 Another version of the list used by the veterinary office is shown in Figure 1-36. How many themes does this list have? What are they?

The list has three themes: PET, OWNER, SERVICE.

1.15 Break the list in Figure 1-36 into tables, each with a single theme. Create ID columns as you think necessary.

PET (PetID, PetName, PetType, PetBreed, PetDOB, *OwnerPhone*)

OWNER (OwnerLastName, OwnerFirstName, OwnerPhone, OwnerEmail)

SERVICE (ServiceID, Service, Date, Charge, *PetID*)