Businesses of every size organize data records into collections called *databases*. At one extreme, small businesses use databases to keep track of customers; at the other extreme, huge corporations such as Dell and Microsoft use databases to support complex sales, marketing, and operations activities. In between are businesses like GearUp that use databases as a crucial part of their operations. Such businesses have a small staff of professionals and can't always support special needs, like those of Addison and Drew at GearUp. To obtain the one-of-a-kind reports they need, Addison and Drew need to be creative and adaptable.

This chapter discusses the why, what, and how of database processing. We begin by describing the purpose of databases and then explain the important components of database systems. We then overview the process of creating a database system and summarize your role as a future user of such systems.

Users have a crucial role in the development of database applications. Specifically, the structure and content of the database depends entirely on how users view their business activity. To build the database, the developers will create a model of that view using a tool called the entity-relationship model. You need to understand how to interpret such models, because the development team might ask you to validate the correctness of such a model when building a system for your use. Finally, we describe the various database administration tasks.

This chapter focuses on database technology. Here we consider the basic components of a database and the functions of database applications. You will learn how Addison used database reporting to solve the GearUp problem in Chapter 9.

Q1 What Is the Purpose of a Database?

The purpose of a database is to keep track of things. When most students learn that, they wonder why we need a special technology for such a simple task. Why not just use a list? If the list is long, put it into a spreadsheet.

In fact, many professionals do keep track of things using spreadsheets. If the structure of the list is simple enough, there is no need to use database technology. The list of student grades in Figure 5-1, for example, works perfectly well in a spreadsheet.

Suppose, however, that the professor wants to track more than just grades. Say that the professor wants to record email messages as well. Or, perhaps the professor wants to record both email messages and office visits. There is no place in Figure 5-1

Figure 5-1
A List of Student Grades, Presented in a Spreadsheet