

CASE 2

TEXTBOOK LEASING

Designing a Relational Database to Create Tables, Forms, Queries, and Reports

PREVIEW

In this case, you'll design a relational database for a business that leases textbooks to college students. After your database design is completed and correct, you will create database tables and populate them with data. Then you will produce a form with a subform, three queries, and one report. The queries will address the following topics: What books are available by a specific author? How long has a particular student leased a book? How many books are leased at each university? Your report will display the outstanding books borrowed by each student, grouped by university.

PREPARATION

- Before attempting this case, you should have some experience in database design and in using Microsoft Access.
- Complete any part of Database Design Tutorial A that your instructor assigns.
- Complete any part of Access Tutorial B that your instructor assigns, or refer to the tutorial as necessary.
- Refer to Tutorial F as necessary.

BACKGROUND

College students incur huge costs for buying required textbooks for their classes. Many students try to recoup some of their expenditures by selling their textbooks back to the bookstore after the semester. However, the money made from such transactions is vastly less than the books' original purchase price. One of your friends, Rita Calderon, a business major, hopes she has found a solution to this expensive problem. Rita has started a Web business that leases textbooks to students at two universities. If the business succeeds, Rita envisions that the business could expand to many other universities in the country. The business plan is simple: buy textbooks in bulk to save money, store them in a central warehouse, and lease the books to students for the semester. When the student is finished with a book for the semester, he or she returns it to the warehouse, where it can be leased to another student for the next semester. The lease rates are about 30 percent of the cost of an average textbook for students. The lease price includes shipping in both directions. Rita hopes that the business will take off. The more schools she can get to participate, the greater the selection of textbooks will be, and the better the chances that students' needs will be more readily fulfilled.

Textbook Leasing, more commonly known as TL, is now serving two large universities: the University of Kansas and the University of New Mexico. You have been hired to create a database to track the available textbooks in the warehouse, the students who sign up for the leasing service, and all their outstanding leased books. The costs of leasing and payments are handled manually at this point, and will be a future database project.

You have several goals for the database. First, you need to keep track of all the textbooks in the warehouse. Books are identified by their ISBN, but students peruse the list by glancing at the book titles. Keep in mind that many textbooks have multiple authors. The books' publication date and publishing company are also useful pieces of information for universities. Of course, you need to keep track of the students signed up for the service. They are known to TL by their student ID, their university, and their campus address. Correspondence with the student is usually by e-mail or cell phone, so this information is needed for the database as well. Finally, the database must be able to record information about students' textbook leases.

As students register for the service and lease books, Rita would like to be able to record this information directly into the database. A form with a subform will be needed to record this information. Eventually, this data will be migrated to the Web so that students can do all their leasing online.

Students often call the office and ask which textbooks are available by a particular author. For example, students might get their syllabus from a professor who lists the required text under a common title like *Biology*. You need to create a query to find a book by the author's name.

Rita would like to know how long some students are keeping their leased textbooks. She'd like a way to input the student's name in a query and show the length of the student's textbook lease. This feature would keep track of students who have not returned their books in a timely fashion. Rita would also like to keep track of the number of rentals at each university where TL operates, for future marketing purposes. A query can determine those numbers.

Finally, you need to create a report that lists outstanding books by university and student.

ASSIGNMENT 1: CREATING THE DATABASE DESIGN

In this assignment, you will design your database tables on paper, using a word-processing program. Pay close attention to the tables' logic and structure. Do not start your Access code (Assignment 2) before getting feedback from your instructor on Assignment 1. Keep in mind that you will need to examine the requirements in Assignment 2 to design your fields and tables properly. It's good programming practice to look at the required outputs before designing your database. When designing the database, observe the following guidelines:

- First, determine the tables you'll need by listing them on paper. List the name of each table and the fields that it should contain. Avoid data redundancy. Do not create a field if it could be created by a "calculated field" in a query.
- You'll need transaction tables. Think about what business events occur with each student's actions. Avoid duplicating data.
- Document your tables using the Table facility of your word processor. Your word-processed tables should resemble the table format in Figure 2-1.
- You must mark the appropriate key field(s). You can designate a key field by entering an asterisk (*) next to the field name. Keep in mind that some tables might need a compound primary key to uniquely identify a record within a table.
- Print the database design.

Table Name	
Field Name	Data Type (text, numeric, currency, etc.)
...	...
...	...

FIGURE 2-1 Table design

NOTE

Have your design approved before beginning Assignment 2; otherwise, you may need to redo Assignment 2.

ASSIGNMENT 2: CREATING THE DATABASE, QUERIES, AND REPORT

In this assignment, you will first create database tables in Access and populate them with data. Next, you will create a form, three queries, and a report.

Assignment 2A: Creating Tables in Access

In this part of the assignment, you will create your tables in Access. Use the following guidelines:

- Enter 10 records for the textbooks, either by using textbooks you might have in your dorm room or by searching for books on the Web. Make sure that some books have multiple authors.

- Type more data into the tables, using the students' names and addresses shown in Figure 2-2. Add your own name, address, and e-mail address as an additional member. Make up student IDs, telephone numbers, and e-mail addresses.
- Each textbook should be leased. Have at least two students lease two books. Make sure you lease a textbook under your own name.
- Appropriately limit the size of the text fields; for example, a telephone number does not need the default length of 255 characters.
- Print all tables.

Last Name	First Name	Address	University
French	Allison	115 Jayhawker	University of Kansas
Rodríguez	John	8-B Sellards	University of Kansas
Marvel	Thomas	678-C Lewis	University of Kansas
Peters	Sally	114 Jayhawker	University of Kansas
Paulson	Hunter	891-A Lewis	University of Kansas
Brown	Jerome	609 Jayhawker	University of Kansas
Chou	Patti	10-D Sellards	University of Kansas
Friedman	Amy	715 Jayhawker	University of Kansas
Petrosky	Paul	101 Coronado	University of New Mexico
Patel	Monisha	899-1 Redondo	University of New Mexico
Lecroix	Yvonne	10-b Santa Ana	University of New Mexico

FIGURE 2-2 Data

Assignment 2B: Creating Forms, Queries, and a Report

You must generate one form, three queries, and one report, as outlined in the Background section of this case.

Form

Create a form and subform based on your STUDENTS table and RENTALS table (or whatever you've named these tables). Save the form as Students. Your form should resemble that in Figure 2-3.

Students

Student ID: 554686

Last Name: Marvel

First Name: Thomas

Dorm Address: 678-C Lewis

University: University of Kansas

Cell Phone: 785-223-9812

Email: TM@ku.edu

ISBN	Student	Date Rented	Date Returned
0789565439	554686	9/1/2009	12/1/2009
1413033075	554686	9/1/2009	12/1/2009
*	554686		

Record: 3 of 3

FIGURE 2-3 Students form and subform

Query 1

Create a query called Books by [author name]. In this example, the author's name is Owen. The output of the query should include columns for Author, Title, and Edition. Your output should resemble that shown in Figure 2-4, although your data will be different.

Author	Title	Edition
Claudia Owen	Earth Lab: Exploring the Earth Sciences	2
*		

FIGURE 2-4 Books by Owen query

Query 2

Create a parameter query called Length of Rentals that prompts the user for the last name of the student. Include columns for Last Name, University, Title, and Length of Rental (a calculated field). If Paulson was entered as the last name and you had a record to match the name, your output would look like that in Figure 2-5, although your data would be different.

Last Name	University	Title	Length of Rental
Paulson	University of Kansas	Earth Lab: Exploring the Earth Sciences	113
*			

FIGURE 2-5 Length of Rentals query

Query 3

Create a query called Number of Rentals that reports a total of all textbooks rented by university. Note the column heading change from the default setting provided by the query generator. Your output should resemble the format shown in Figure 2-6, but the data will be different.

Number of Rentals	
University	Number of Rentals
University of Kansas	7
University of New Mexico	3

FIGURE 2-6 Number of Rentals query

Report

Create a report called Books per University. Your report's output should show headings for University, Last Name, Dorm Address, Title, and Edition. First create a query for input to the report. Bring the query into the Report Wizard and group it on the University field. Depending on your data, your output should resemble that shown in Figure 2-7.

Books per University				
University	Last Name	Dorm Address	Title	Edition
University of Kansas				
	Friedman	715 Jayhawker	Computer Concepts	10
	Brown	609 Jayhawker	Advanced Cases in MIS	
	Paulson	891-A Lewis	Earth Lab: Exploring the Earth Sciences	2
	Peters	114 Jayhawker	Financial Mathematics: Modeling and Hedging	
	Marvel	678-C Lewis	Horizons	4
	Marvel	678-C Lewis	HTML	2
	French	115 Jayhawker	Essentials of Oceanography	5
University of New Mexico				
	Patel	899-1 Redondo	Essentials of Meteorology	5
	Petrosky	101 Coronado	Electronic Commerce	
	Petrosky	101 Coronado	Principles of Information Systems	6

Wednesday, July 02, 2008 Page 1 of 1

FIGURE 2-7 Books per University report

ASSIGNMENT 3: MAKING A PRESENTATION

Create a presentation that explains the database to Rita and the other people who run TL. Include the design of your database tables and instructions for using the database. Discuss future improvements to the database, such as including leasing prices and payments. Your presentation should take fewer than 10 minutes, including a brief question-and-answer period.

DELIVERABLES

Assemble the following deliverables for your instructor, either electronically or in printed form:

1. Word-processed design of tables
2. Tables created in Access
3. Form and subform: Students
4. Query 1: Books by Owen
5. Query 2: Length of Rentals
6. Query 3: Number of Rentals
7. Report: Books per University
8. Presentation materials
9. Any other required tutorial printouts or electronic media

Staple all pages together. Put your name and class number at the top of each page. Make sure that your diskette, CD, or USB memory stick is labeled, if required.