

# CASE 4

## THE CAR SHARE RESERVATION DATABASE

### *Designing a Relational Database to Create Tables, Forms, Queries, Reports, and Navigation Panes*

#### PREVIEW

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In this case, you'll design a relational database reservation system for a car share business in Atlanta. After your design is completed and correct, you will create database tables and populate them with data. Then you will produce a form with a subform, five queries, a report, and a custom navigation pane. The form will record the reservations for each car. The queries will display customers who are students with driving violations, popular pickup locations, cars that hold a certain number of passengers, and rental trends. Another query will allow the company to increase the rental price of its vehicles. The report will summarize rentals for the month so far, along with the amount of money charged to each customer. The custom navigation pane will allow access to all tables, forms, queries, and the report.

#### PREPARATION

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- 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

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Atlanta Car Share is a company that rents cars by the hour or day to Atlanta residents. The model is simple: Customers register for the service, book their reservations on the Web, and pick up their car from one of three areas in the city. They are given a code to open a central pod where they can find the key to their car. The car comes with at least a quarter-tank of gasoline and a credit card for further fill-ups. The cost of sharing the car therefore includes the gas used. Prices for sharing cars begin at \$3.90 an hour and \$39.00 per day. The price also includes insurance for the car. Because you are proficient in Microsoft Access, you have been hired to create a reservation database for ACS.

You must keep several parameters in mind when designing the database. When potential customers register for ACS, they need to provide a certain amount of information and indicate whether they are students. The required information includes full name, address, telephone number, cell phone number, e-mail address, and credit card number. Customers need to divulge any tickets or infractions on their driving record, along with a current driver's license number, state of issue, and expiration date.

ACS has a variety of cars available for sharing. The cars vary by make, model, and rental price. Customers often want to search for cars by size, so it's important to note the maximum number of people that can comfortably fit into the car. ACS has three central locations for picking up and dropping off cars. When customers reserve a car, they note the location code for picking up and dropping off. It would be convenient to have a form with a subform to record customer reservations.

ACS management would like to have a listing of customers who are students and who have had violations over the past three years, such as running a red light. Those customers would be put on probation, which is a

period of watching their driving habits in the shared cars more closely than normal. A query could provide this listing.

Customers often telephone the main office of ACS and want to know how many passengers a car will hold. The management wants you to set up a query to answer that question. The query would prompt the user to enter the number of passengers desired, and the output would display all vehicles that could handle that number.

ACS management would like to do some data analysis to plan for future expansion. First, they want you to create a query that lists the most popular pickup locations for cars. They suspect that one location is the customers' favorite, but they want to confirm that suspicion. In addition, they want to know which types of customers are sharing which types of cars. In particular, they want the data separated into student and nonstudent groups.

Fuel costs have skyrocketed recently, so ACS would like to raise the price of sharing all vehicles by \$0.50 per hour and \$5.00 per day. ACS wants you to create an update query to increase the prices.

The management likes to get periodic reports that show how the company is doing. You'll need to create a report for the current month that shows the rental reservations and the potential income from each reservation. Finally, a custom navigation pane should be set up to make it easy to work with the database.

## 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 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 a transaction table. Avoid duplicating data.
- You'll need a logical field.
- Document your tables using the Table facility of your word processor. Your word-processed tables should resemble the format shown in Figure 4-1.
- 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, if required by your instructor.

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

FIGURE 4-1 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 and subform, five queries, a report, and a custom navigation pane.

## Assignment 2A: Creating Tables in Access

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

- Type records into the tables, using names and addresses from your friends. Create at least eight customers. Make up data for e-mail addresses and driver's licenses.
- Assume that five vehicles are available for sharing.
- Create at least 11 reservations. Assume that all the data is for one month.
- Appropriately limit the size of the text fields; for example, a zip code does not need the default length of 255 characters.
- Print all tables, if required.

## Assignment 2B: Creating Forms, Queries, Reports, and Navigation Panes

You will create one form with a subform, five queries, one report, and one custom navigation pane, as outlined in the Background section of this case.

### Form

Create a form with a subform that lists the details of individual cars and their reservations. Your data will vary, but the output should resemble that in Figure 4-2.

Reservation Number	Date Reserve	Pickup	Drop Off	Car ID	Customer	Location
101	2/3/2010	2/3/2010 9:00:00 AM	2/3/2010 12:00:00 PM	101	M-62	60
102	2/3/2010	2/3/2010 1:00:00 PM	2/3/2010 5:00:00 PM	101	F-59	59
110	2/15/2010	2/15/2010 9:00:00 AM	2/15/2010 5:00:00 PM	101	B-17	60
111	2/17/2010	2/17/2010 9:00:00 AM	2/17/2010 5:00:00 PM	101	B-17	60
				101		

FIGURE 4-2 Cars form

### Query 1

Create a query called Customers on Probation that filters all customers who are students and who have had tickets in the last three years. The query should include columns for Last Name, First Name, and Email Address. Depending on the data, the query output might resemble that in Figure 4-3.

### Query 2

Create a query called Number of Passengers. This query should prompt the user for the number of passengers required in their shared car. The query should display columns for Car ID, Make, Model, Price Per Hour, and Number of Passengers. The number of passengers should meet the required number specified. Your data will differ, but if you enter data for four or more required passengers, your output should resemble that in Figure 4-4.

Customers on Probation		
Last Name	First Name	Email Address
Murray	Annabelle	belle@comcast.net
Quinn	Sean	quinn45@gmail.com
Smith	Patricia	patti1@gmail.com
*		

FIGURE 4-3 Customers on Probation query

Number of Passengers				
Car ID	Make	Model	Price Per Hour	Number of Passengers
101	Subaru	Impreza	\$3.90	5
102	Lexus	IS250	\$5.00	5
104	Toyota	Prius Liftback	\$5.50	5
105	Honda	Element	\$3.90	5
*				

FIGURE 4-4 Number of Passengers query

### Query 3

Create a query called Popular Locations. Using the functionality of the query, determine how many rentals have occurred in each location. The query should include columns for Location ID, Street Address, Telephone, and Number of Rentals. Note that the column headings are a change from the default settings provided by the query generator. Your data will differ, but the output should resemble that in Figure 4-5.

Popular Locations			
Location ID	Street Address	Telephone	Number of Rentals
60	800 Cherokee Drive	404-776-1022	8
59	1400 W Peachtree NE	404-897-0021	2
61	2238 Perkerson Road	404-223-1056	1

FIGURE 4-5 Popular Locations query

### Query 4

Create a query called Rental Trends. Again, using the functionality of the query, determine the number of times each model has been rented. The query should include the columns Make, Model, Student?, and Number of Times Rented. Sort the query by Student. Note that the column headings are a change from the default settings provided by the query generator. Your output should resemble that in Figure 4-6, with different data.

Rental Trends			
Make	Model	Student?	Number of Times Rented
Lexus	IS250	<input checked="" type="checkbox"/>	2
Smart	Passion	<input checked="" type="checkbox"/>	2
Subaru	Impreza	<input checked="" type="checkbox"/>	1
Honda	Element	<input type="checkbox"/>	2
Subaru	Impreza	<input type="checkbox"/>	3
Toyota	Prius Liftback	<input type="checkbox"/>	1

FIGURE 4-6 Rental Trends query

### Query 5

Create an update query called Increased Price that adds \$0.50 to each rental price per hour and \$5.00 to each rental price per day. Run the query to test it.

### Case 4

## Report

Create a report called February Rentals to Date. (Your month may vary, depending on when you entered your data.) You must first create a query to use for your report.

- Create a query that includes headings for Last Name, First Name, Date Reserved, Make, and Model.
- Add a calculated field for Total Due. This calculated field must be an If statement that uses the following rule: If the rental is for more than 10 hours, then use the price per day times the number of days; otherwise, use the price per hour times the number of hours.
- Bring the query into the Report Wizard, group on Last Name, and sum the Total Due.
- Adjust your report so the output looks like that in Figure 4-7, with different data.

Last Name	First Name	Date Reserved	Make	Model	Total Due
Berry	Anna				
		2/17/2010	Subaru	Impreza	\$31.20
		2/15/2010	Subaru	Impreza	\$31.20
Grand Total for Customer					\$62.40
Franco	Gianne				
		2/3/2010	Subaru	Impreza	\$15.60
Grand Total for Customer					\$15.60
Lopato	Maria				
		2/5/2010	Honda	Element	\$78.00
Grand Total for Customer					\$78.00

**FIGURE 4-7** February Rentals to Date report

## Custom Navigation Pane

Create a custom navigation pane named Car Share Reservations to access the database contents easily. Your custom navigation pane should look like that in Figure 4-8. Note that the tables are not shown to avoid revealing the solution to Assignment 1.

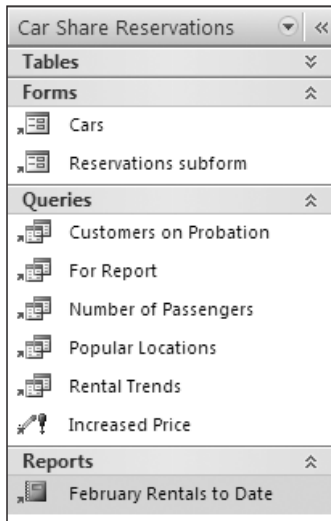


FIGURE 4-8 Car Share Reservations custom navigation pane

## ASSIGNMENT 3: MAKING A PRESENTATION

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Create a presentation for the management of Atlanta Car Share. Pay particular attention to database users who are not familiar with Microsoft Access. Your presentation should take fewer than 15 minutes, including a brief question-and-answer period.

### DELIVERABLES

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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: Cars
4. Query 1: Customers on Probation
5. Query 2: Number of Passengers
6. Query 3: Popular Locations
7. Query 4: Rental Trends
8. Query 5: Increased Price
9. Report: February Rentals to Date
10. Navigation pane: Car Share Reservations
11. 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 electronic media is labeled, if required.