

SOLUTIONS MANUAL

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PROBLEM-SOLVING CASES IN MICROSOFT® ACCESS™ AND EXCEL®



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The Dream Machine Rental Company

4 CASE

DESIGNING A RELATIONAL DATABASE TO CREATE TABLES, QUERIES, A SWITCHBOARD, AND A REPORT

PREVIEW

In this case, you'll design a relational database for a company that rents luxury automobiles, adding your own data fields, queries, or reports in addition to those required by your client. After your database design is completed and correct, you will create database tables and populate them with data.

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 E as necessary.
- In this case, you will be using the following features of Access: Parameter queries, Summation queries, Select queries, Delete queries, Switchboards, and Reports.

5 BACKGROUND

In your university town, there is a company called The Dream Machine that rents luxury automobiles and provides limousine service. Beginning in 2000 with only two limousines, the owner has expanded his market to rent luxury self-drive cars. Because business has become very brisk at The Dream Machine, the company's owner has hired you to design and create a database system for the company.

The Dream Machine currently rents a varied fleet of vehicles:

- Two limousines, one white and one black, to cater to the customers' color preferences. Limousine rental includes the services of a uniformed chauffeur. Each limousine accommodates 10 to 12 persons.
- Two self-drive luxury cars: a new Bentley Continental GT Coupe that seats 5 persons, and a Rolls Royce Phantom that seats 5 to 6.
- Three self-drive high-performance sports cars: a red Ferrari that seats two persons, a Jaguar XJ that seats 4, and Range Rover that seats 5.
- Two other vehicles will be added to the fleet at the end of the month.

Here's how the business operates: When booking a rental, the company owner immediately checks on the customer's identification to ensure the customer is over 25 years of age (the company's insurance regulations for self-drive vehicles only). Customers are told that limousines are rented by the day, but a "day" is considered to have a limit of 6 hours. The self-drive vehicles are rented for an entire day, but they must be returned by 11 a.m. the following day or incur charges for another full day. (The afternoon is spent cleaning a vehicle for the next customer and restocking a limousine with niceties and requested items.) Because business is very busy, the owner requires that a deposit on the reservation be paid within 7 days of booking. High school students who book limousines for proms often make many installment payments, as do some brides. By contrast, those who rent high-performance sports cars are often repeat customers who pay the full amount in advance.

The owner is somewhat unsure of his exact needs, but he is sure that the database should perform the following tasks:

1. The owner would like to run a query to see which cars have been booked and the dates on which they are booked.
2. Sometimes, people call in to cancel their booking before making a deposit. The owner would like an easy way to delete a booking in a query.
3. Potential customers call in and ask for automobiles that can accommodate a certain number of people. Here, you will need to create a Parameter query that responds with the appropriate vehicle for the number of passengers required.
4. After reserving a vehicle, customers have 7 days in which to make a deposit on their reservation. They can continue paying for the rental in installments, or pay the entire amount. The owner would like a simple way to figure out how much money is remaining on every customer's reservation. You need to create a query that calculates the remaining balance.
5. The chauffeurs need to know when they have been hired to drive the limousines. The chauffeurs don't know how to use computers. The owner would like you to set up a Switchboard so the drivers can simply click on the button, type in their name, and see when they are needed for work, which is executed through a report.

Thus, your client has identified some—but not all—of his business needs. A good consultant provides extra value to clients by anticipating needs that the client has not yet considered. Consider your client’s business operation. What other kinds of information could and should the database provide to your client?

✚ 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 look at what is required 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 kinds of information and data that the database should provide that the owner has NOT considered. Identify these data items.
- Second, determine the tables you’ll need by listing on paper 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 a transaction table. Avoid duplicating data.
- Think about a logical field that you need to build in to the tables.
- Document your tables by using the Table facility of your word processor. Your word-processed tables should resemble the format of the table in Figure 4-1.
- You must mark the appropriate key field(s). You can designate a key field by an asterisk (*) next to the field name. Keep in mind that some tables need a compound primary key to uniquely identify a record within a table.
- Print out the database design.

TABLE NAME	
<i>Field Name</i>	<i>Data Type (text, numeric, currency, etc.)</i>
...	...
...	...

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 A DATABASE AND DEVELOPING QUERIES, A SWITCHBOARD, AND A REPORT

In this assignment, you will first create database tables in Access and populate them with data. Save your database as **THE DREAM MACHINE.mdb**. Next, you will create four queries, one switchboard, and one report. To assist the owner, you will go beyond these requirements, creating whatever additional queries or reports that you feel are warranted.

Assignment 2A: Creating Tables in Access

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

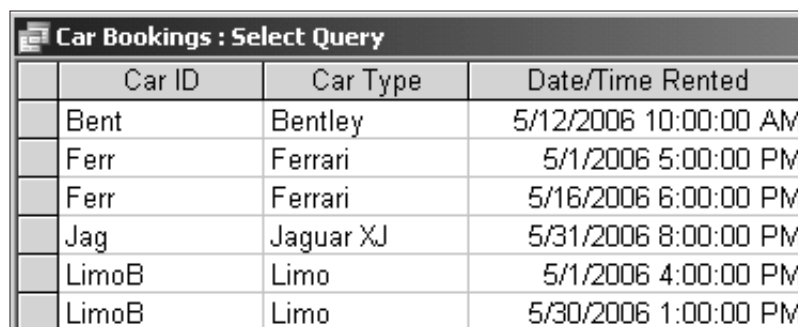
- Type records into the tables, using the vehicles of White Limousine, Black Limousine, Rolls Royce, Bentley, Ferrari, Jaguar, and Range Rover. As mentioned in the Background, two additional vehicles will be joining the fleet at the end of the month. Choose any two other vehicles that you like, and add them to the records.
- One limousine is black and one is white; the Ferrari is red. For all other vehicles, choose your own colors. Note the seating capacity for the two new vehicles that you choose.
- Using your own past experience or Internet research, set some daily rental rates for all vehicles.
- Assume that there are three drivers, and they are referred to by their last names: Lewis, Orney, and Fredricks.
- Create 15 bookings for a one-month period, some deposits, and some customers.
- Appropriately limit the size of the text fields; for example, a Phone Number field does not have to be the default 50 characters in length.
- Print all tables.

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

There are four queries, one switchboard, and one report to generate, as outlined in the Background of this case. Begin with the first query.

Query 1: Car Bookings

The owner needs to know the dates on which each vehicle is booked. Create a query that displays that information, showing Car ID, Car Type, and Date/Time Rented. Sort the output on Car ID, Car Type, and Date/Time Rented. Your data will vary, and you may want to add additional information, but your core output should resemble that in Figure 4-2 (only a portion shows). Run the query and print the output.



Car ID	Car Type	Date/Time Rented
Bent	Bentley	5/12/2006 10:00:00 AM
Ferr	Ferrari	5/1/2006 5:00:00 PM
Ferr	Ferrari	5/16/2006 6:00:00 PM
Jag	Jaguar XJ	5/31/2006 8:00:00 PM
LimoB	Limo	5/1/2006 4:00:00 PM
LimoB	Limo	5/30/2006 1:00:00 PM

Figure 4-2 Car Bookings query

Query 2: Delete Booking

During the busy prom season, limousines are often booked temporarily but then the reservation is cancelled before the deposit is required. The owner would like to be able to delete such a record. Create a delete query to do just that. Save it as Delete Booking. Test the query by inputting a booking record and then deleting that record. Check the table to make sure the record was deleted. Print out the table and note with your pen which record was deleted.

Query 3: Number of Passengers

Customers call and ask for vehicles that can accommodate a certain number of passengers. Create a Parameter query that displays those vehicles that have the requested capacity. Depending on your data, if you typed in the requirement of 12 people, you might get the output as shown in Figure 4-3. Show the Car Type, Color, Number of Passengers, and Price per Day. Choose a capacity, run the query, and print the output.

Number of Passengers : Select Query				
	Car Type	Color	Number of Passenge	Price per Day
	Limo	White	12	\$720.00

Figure 4-3 Number of Passengers query

Query 4: Payments Remaining

Customers are required to make a deposit on their reservation within seven days of booking. They also can make payments on the reservation up to the time of rental, when the entire balance is due. The owner would like to run a query that shows the customer’s Name, Address, Telephone, and any Payments Remaining. To do this, you must first make a query that calculates all the payments made on a given booking (because some bookings have more than one payment). Then, use that query in another query to calculate the payments remaining. Your data will vary, and you may have additional columns of information, but the core output of the query should resemble that shown in Figure 4-4. Print the query output.

Payments Remaining : Select Query				
	Name	Address	Telephone	Payments Remaining
	Kathy Lopez	56 Myra Close, Avondale, PA 14556	(610)345-0987	\$50.00
	Angela Bernolli	4576 Kirkwood Hwy, Wilmington, DE 19808	(302)889-0987	\$500.00
	Kevin Barron	1 Close Circle, Hockessin, DE 19803	(302)998-7865	\$220.00
	▶ Sam O'Hara	56 Church Road, Newark, DE 19711	(302)876-7765	\$500.00

Figure 4-4 Payments Remaining query

Report: Drivers Required

The chauffeurs need an easy way to check on their driving assignments. They are not very computer literate, so you need to create a Switchboard they can use to simply click on their assignments. Before you make the switchboard, you must first make a report, based on a Parameter query, that prompts for the driver’s name. After the driver’s name is inputted, the resulting report should show the Driver Name, the Car ID, and the Date/Time Rented, as illustrated in Figure 4-5. Print the query output after inputting a sample driver’s name.

<i>Drivers Required</i>		
<i>Driver Name</i>	<i>Car ID</i>	<i>Date/Time Rented</i>
Fredricks	LimoW	5/29/2006 11:00:00 AM
Fredricks	LimoW	5/18/2006 11:00:00 AM
Fredricks	LimoW	5/5/2006 3:00:00 PM

Figure 4-5 Drivers Required report

Switchboard: The Dream Machine

After the report is created, you must create a switchboard for the drivers to use to run their Drivers Required report. Assign the button a title of Driver Assignment, as shown in Figure 4-6. Print the Switchboard interface by clicking File—Print while the Switchboard is visible on your screen.

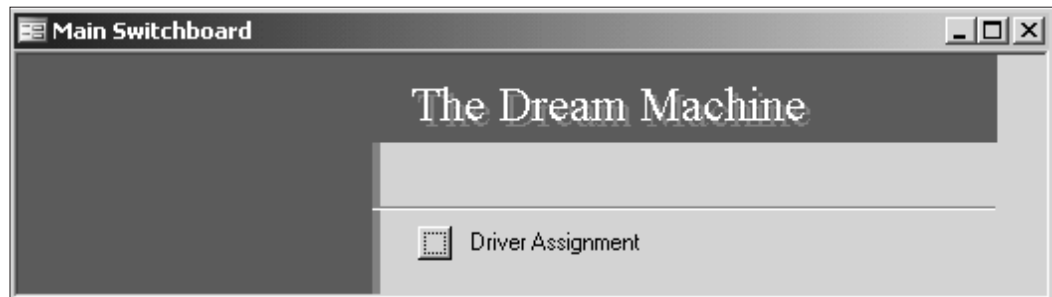


Figure 4-6 The Dream Machine Switchboard

✚ MAKING A PRESENTATION

Create a presentation for the owner. Explain the database and your additions to his requirements. You might also wish to make suggestions for future expansion of the database. Include the following in your presentation:

- Describe the design of your database tables.
- Tell how to use the database, per the owner's original requests: entering information, running the queries, using the switchboard, and generating the report.
- Explain the additional work that you've done for your client. This might include creating additional fields, queries, switchboards, or reports. Some suggestions might include the following: an Income Report; a Payroll Report for the chauffeurs; YES/NO fields for Damage to Vehicle, Repeat Customer, Late Return; an Actual Time Returned field; a section for noting extra charges for limo requests (French champagne, caviar, certain snacks).

5 DELIVERABLES

1. Word-processed design of tables
2. Tables created in Access
3. Query 1: Car Bookings
4. Table: Bookings (after Delete Query)
5. Query 3: Number of Passengers
6. Query 4: Payments Remaining
7. Report: Drivers Required
8. Switchboard: The Dream Machine Switchboard
9. Presentation materials
10. Any other required tutorial printouts, tutorial disk, or CD

Staple all pages together. Put your name and class number at the top of the page. Make sure your disk or CD is labeled.