CASE 5

THE GOURMET TEA INVENTORY DATABASE

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

PREVIEW

In this case, you'll design an inventory system relational database for a gourmet tea company. 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, five queries, two reports, and a navigation pane. The form and subform will record all customer orders. The queries will display the most popular product, the best customers, and how often the inventory turns over. Other queries will update the inventory to reflect purchases and orders shipped. The reports will summarize weekly sales and weekly purchases. The navigation pane will allow access to the form and subform, queries, and reports.

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

The Gourmet Tea Company (GTC) has hired you to create its inventory system. GTC is interested in eventually purchasing some Enterprise Resource Planning software (ERP) because company managers have heard good things about it from other small businesses. Thinking that ERP was only for large corporations, the company had previously ignored all solicitations for such software. Now the managers realize that an ERP system might be an efficient way to run the company. Because you have some experience in Microsoft Access, you've been hired to create an inventory system that would show the Gourmet Tea Company some of an ERP system's capabilities. Before you begin this job, you explain to the company that your system would not be nearly as complicated as a full ERP system, but that your prototype system can show the company how an ERP system might help their business.

The first step is to design the database. ERP databases are huge, but yours will be relatively small, although the design concepts are similar. Also, you must keep in mind a number of parameters when designing the database for GTC. For example, the company consistently buys tea from the same suppliers. These suppliers sell GTC different types of tea in differing package sizes, as noted by the number of bags per box, or they sell loose tea by the pound. Your task is to begin with a small segment of the business (the bag business only) as a prototype for the larger system. Customers are also involved in the inventory process, because their orders deplete the inventory levels. You begin with a small customer base for this prototype system. All orders take place via telephone, although GTC would like to sell its products online eventually.

When an order comes into GTC, the sales clerk assigns a unique order number, records the date, and records a customer ID number. Then, using the order number, the clerk records the order of specific types of tea. Most

customers order a variety of teas. A database form would be useful to streamline this operation. In an ERP system, you could also customize input screens for data flow directly into the database.

Of course, any good business needs to track trends. The owners of GTC would like to track both the most popular product and its best customers (in terms of dollars spent) using database queries.

One important metric that an ERP system can track is inventory turnover. If inventory is moved rapidly through the supply chain, then the company will recoup its investment in inventory more quickly than if it languishes in the warehouse. In addition, tea is a perishable item that cannot be stored indefinitely. GTC's warehouse is quite small, and the company doesn't currently have the capital resources to expand. Therefore, GTC needs to track the movement of inventory, from the replenishment of stock to the sale to the customer, via a database query.

As orders are placed and filled, the inventory needs to be updated. This can be accomplished with an update query, which could be run daily after working hours. Similarly, as purchases from suppliers are made and shipped into the warehouse, the inventory needs to be updated on a daily basis, using an update query. Keep in mind that in an ERP system, such queries would be run as the inventory comes in and goes out, in real time, not on the batch basis you are using for the prototype.

The owners of GTC would like you to create two reports for further business analysis. The reports should display the weekly orders to each customer and the weekly purchases from each supplier. ERP systems have many built-in reporting tools for standard or customized reports.

Finally, you suggest that a navigation pane should be created to simplify access to the form and subform, queries, and reports.

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 number of transaction tables. Avoid duplicating data.
- Consider using line-item tables for some of the transaction tables.
- Document your tables using the Table facility of your word processor. Your word-processed tables should resemble the format in Figure 5-1.
- 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 5-1 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 with a subform, five queries, two reports, and a 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 your friends' and relatives' names and addresses. Create at least 10 customers.
- Assume that three products are available for sale: English Breakfast Tea, 100 bags at $10.00 a box; Earl Grey Tea, 50 bags at $8.00 a box; and Chai Tea, 50 bags at $7.00 a box.
- Create two suppliers, one in the United States and one in Canada. Make up names, addresses, and other important information such as telephone numbers.
- Make up supplier transaction data for one week. Assume that each supplier fills at least two orders during that week.
- Make up customer transaction data for one day during that week. Have every customer order once, and have some of them specify multiple products in their orders.
- 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 your instructor requires it.

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

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

Form

Create an order form that includes the main information from the order, such as the order number, customer number, and date. Include the line-item details of the order in the subform. Your data will vary, but the output should resemble that in Figure 5-2.

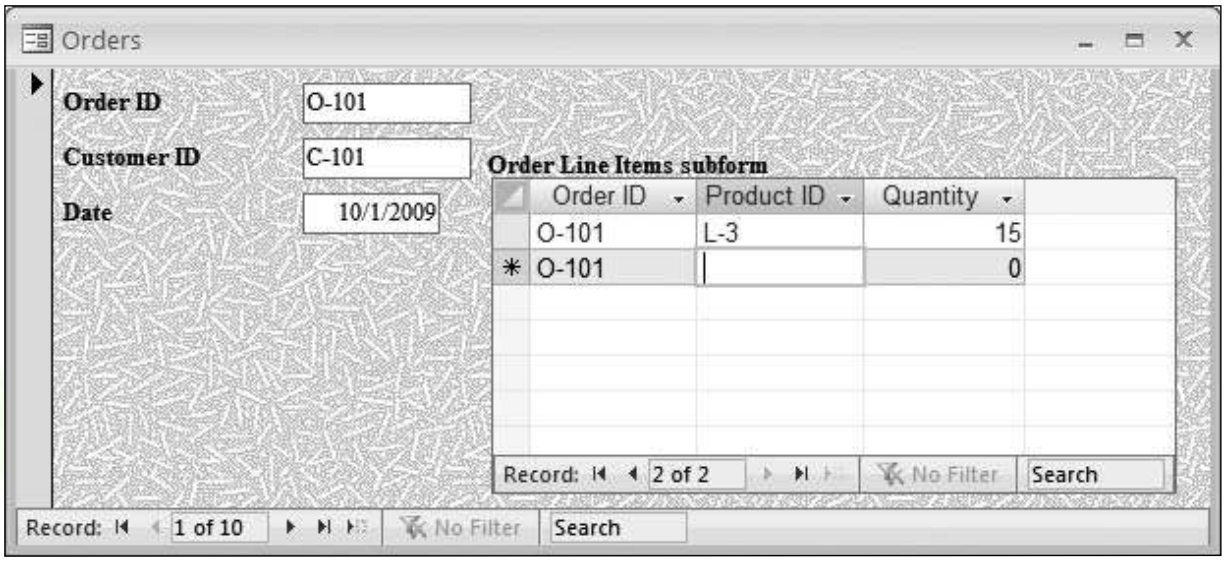


FIGURE 5-2 Orders form

Query 1

Create a query called Most Popular Product. Display columns for Product Name, Product Size, and Quantity Ordered. Be sure to sort your output. Your data will differ, but your output should resemble that in Figure 5-3. Note that the column headings are a change from the default settings provided by the query generator.

Most Popular Product

Product Name	Product Size (pounds)	Quantity Ordered
Chai	50	62
Earl Grey	50	55
English Breakfast	100	35

FIGURE 5-3 Most Popular Product query

Query 2

Create a query called Best Customers. Display columns for Customer First Name, Customer City, Customer E-mail, and the Total Ordered, which is a calculated field. Again, you must sort your output. Your data will differ, but the output should resemble that in Figure 5-4. Note that the column headings are a change from the default settings provided by the query generator.

Best Customers

Customer First Name	Customer City	Customer E-mail	Total Ordered
Jane	Dallas	cart@zoom.net	$250.00
Geoff	Toronto	Zee@cbd.com	$200.00
James	Dearborn	bigfish@lightening.com	$125.00
Frederick	San Diego	fredo@aol.com	$120.00
Shamica	Miami	altuna@comcast.net	$105.00
Noel	Nashville	rye@comcast.net	$105.00
Charlotte	Wichita	charley@aol.com	$105.00
Andy	Las Vegas	andyb@comcast.net	$104.00
Ellie	Indianapolis	elliemay@aol.com	$80.00
Hank	Charlotte	tibby@zoom.net	$30.00

FIGURE 5-4 Best Customers query

Query 3

Create a query called Inventory turnover. You'll need to create two queries first and then use them as input to the final query. The queries should prompt for today's sales date and for this week's inventory replenishment (the start and stop dates). In the final query, display only columns for Product Name, Amount Shipped This Week, and Amount Ordered Today. Note that the column headings are a change from the default settings provided by the query generator. If you ran this query, your output would resemble that in Figure 5-5, but it would have different data.

Query 4

Create an update query called Add to Inventory that adds today's purchases from the suppliers to the current inventory. Do not run the query; simply set it up and save it.

Inventory Turnover

Product Name	Amount Shipped This Week	Amount Ordered Today
English Breakfast	47	35
Earl Grey	45	55
Chai	87	62

FIGURE 5-5 Inventory Turnover query

Query 5

Create an update query called Subtract from Inventory that subtracts today's orders made by customers from the current inventory. Do not run the query; simply set it up and save it.

Report 1

Create a report called Weekly Sales. Your report's output should show headings for Customer Last Name, Customer City, Product Name, Quantity, and Total Value. You first need to create a query that calculates the Total Value of the orders for the current week only. Group the report by Customer Name. Adjust the output so that Customer City is on the same line as the Customer Last Name. Clean up the report by deleting any extra total lines and making sure all data is in the correct format. Your data will differ, but your output should resemble that in Figure 5-6 (only a portion of the report appears).

Weekly Sales

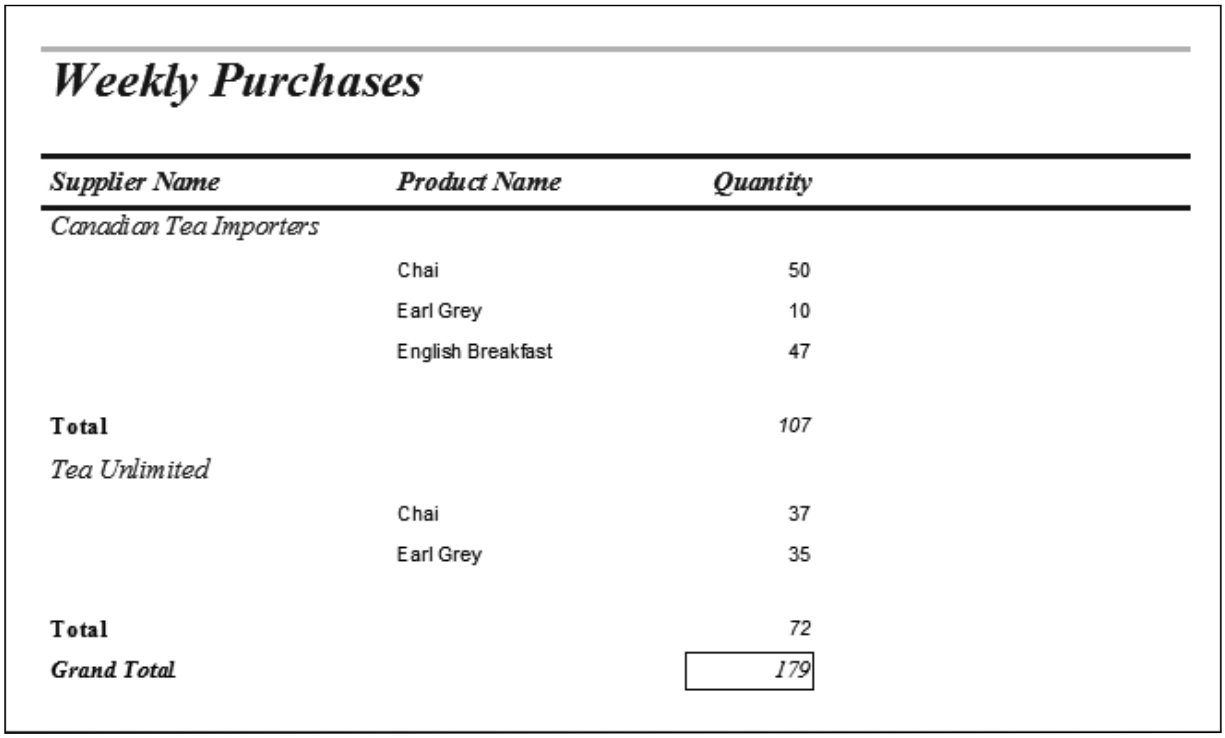
Customer Last Name	Customer City	Product Name	Quantity	Total Value
Altuna	Miami			
		Chai	15	$105.00
Total Ordered			15	$105.00
Bergonia	Dearborn			
		Earl Grey	5	$40.00
		Chai	5	$35.00
		English Breakfast	5	$50.00
Total Ordered			15	$125.00
Born	Las Vegas			
		Earl Grey	5	$40.00
		Chai	2	$14.00
		English Breakfast	5	$50.00
Total Ordered			12	$104.00

FIGURE 5-6 Weekly Sales report

Report 2

Create a report called Weekly Purchases. Your report's output should show headings for Supplier Name, Product Name, and Quantity. You first need to create a query to accumulate the data for the current week only.

Group the report by Supplier Name. Clean up the report by deleting any extra total lines and making sure all data is in the correct format. Your data will differ, but your output should resemble that in Figure 5-7.



Weekly Purchases

Supplier Name	Product Name	Quantity
Canadian Tea Importers		
	Chai	50
	Earl Grey	10
	English Breakfast	47
Total		107
Tea Unlimited		
	Chai	37
	Earl Grey	35
Total		72
Grand Total		179

FIGURE 5-7 Weekly Purchases report

Navigation Pane

Create a navigation pane called Easy Navigation to access the form, queries, and reports easily. Your navigation pane should look like that in Figure 5-8.

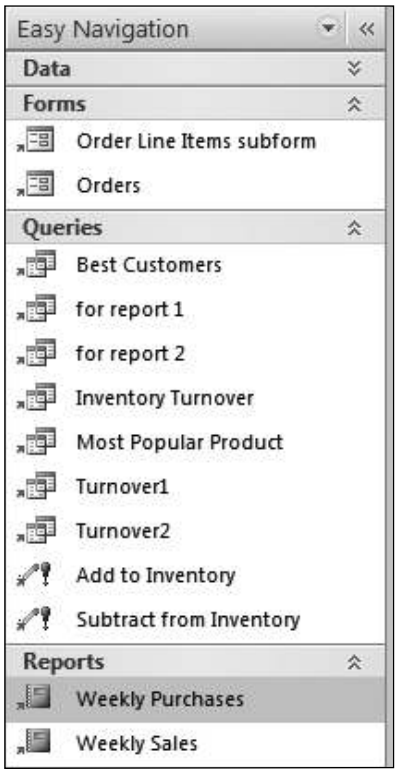


FIGURE 5-8 Easy Navigation navigation pane

ASSIGNMENT 3: MAKING A PRESENTATION

Create a presentation for the Gourmet Tea Company. 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

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: Orders
4. Query 1: Most Popular Product
5. Query 2: Best Customers
6. Query 3: Inventory Turnover
7. Query 4: Add to Inventory (not printed)
8. Query 5: Subtract from Inventory (not printed)
9. Report 1: Weekly Sales
10. Report 2: Weekly Purchases
11. Navigation pane: Easy Navigation (not printed)
12. 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 printouts or electronic media are labeled, if required.