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## Database Case 4

### Clifford's Pharmacy

Problem:	Summarize and analyze data from a transaction processing system for government reporting requirements
Management Skills:	Organize Control
Access Skills:	Queries Sorting Data Reduction Reporting
Data Table:	CLIFFORD

Richard Clifford, the owner and pharmacist of Clifford's Pharmacy in Portland, OR, was going through his daily mail and came across a letter he had been expecting from the state government. The letter informed him of new regulations and reporting requirements for certain categories of drugs.

The Oregon state government had begun an initiative to restrict the growing use of addictive and dangerous drugs. One of the first steps involved identifying the type and amount of these drugs sold by each pharmacy in the state. The state then intended to analyze this data and identify any regional trends.

The new regulations had been discussed at a recent meeting of Richard's local chapter of the Pharmacy Guild, the state professional body for pharmacists. Most pharmacists agreed that the new controls were a good idea, but the thought of yet another record-keeping chore was not attractive.

Three years ago each of the members of Richard's Pharmacy Guild had installed a personal computer with software to manage the pharmacy prescription process. When a customer wanted a prescription filled, the pharmacist entered his or her personal details (if a new customer) and the drug and dosage requirements prescribed by the doctor. The system produced three outputs: a label to affix to the medication, a repeat prescription if required, and a detailed receipt for the customer for insurance purposes. For regular customers, the software could check whether new medication would interact adversely with any existing medication.

The letter from the government specified that usage information was required for only six classes of drugs: sedatives, analgesics, anti-hypertensives, diuretics, anti-inflammatory drugs and anti-depressives. At any given time, Richard's pharmacy stocked around 100 drugs in these target groups.

The government required each pharmacy to submit a quarterly summary report indicating the usage of each drug issued in the six target classes during this period. Total usage of these six

classes was also required. The government would conduct random cross checks with drug company delivery records to check the accuracy of the reporting. Severe penalties were specified for non-compliance.

The table below shows a sampling of the codes assigned to drug classes used by Richard's pharmacy prescription program. Use this to identify the drug codes of interest to the government.

DRUG CODE	DRUG CLASS
A1	Steroids
A2	Diuretic
A3	Anti-hypertensives
A4	Analgesics
G7	Anti-diarrhoea
G8	Birth Control
G9	Sedatives
P1	Anti-inflammatories
P2	Anti-malaria
P3	Antibiotic
P4	Anti-depressives

ChemTech, the firm that had provided the computerized prescription system, had also attended the Pharmacy Guild's meeting. They said it would take many weeks to change the current system to meet the government's requirements. They quoted a very high fee, and a three-month delay before conversion would be possible. They could, however, immediately deliver an add-on program that would convert each quarter's prescriptions into a generic data format, which could be readily used by various Windows-based database packages.

For a low cost solution, ChemTech recommended that each pharmacist purchase a Windows-based database package and use it with the conversion program to perform the government's usage analysis.

The database package also could have other purposes. Many of the pharmacies stocked a range of gift lines, vitamins, and fashion accessories, and used a manual-card system to keep track of their inventory and suppliers in these areas. Using a database to automate this side of the business was another attractive idea.

Richard felt confident that he could design a database program to meet state government needs. The job could be performed on the pharmacy's personal computer on weekends when the store was closed. Richard estimated that he used only two or three of the drugs on the target list on any given day. He also believed that some of the information required by the government would be useful for his business. For example, it would be handy to know how much he sold of each company's drugs.

One problem still bothered Richard. Each drug company supplied medication in different tablet sizes. The strength of each tablet also varied in terms of milligram dosage. The government needed its usage statistics to be reported in milligrams (mgs). Fortunately, the pharmacy prescription system recorded both the number of tablets and their strength (in mgs) used for each prescription. To satisfy the government's requirements, Richard needed only to multiply the number of tablets by strength to get total milligram usage.

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Part of the data table produced by the conversion program for a quarter's of prescriptions issued by Clifford Pharmacy has been saved as an Access table called CLIFFORD on SOLVEIT.MDB. Create a new empty database, and import this table now.

**Tasks:** There are six tasks in this case:

1. Design a query to filter out all of the drugs **not** of interest to the state government.
2. Design a summary report to present to the state government each quarter. Include only the total drug usage and the sub-total usage for each Drug Code. The report should be sorted by Drug Code. Do not include the individual prescription records.
3. Print this report.
4. Richard would like to discover which drug companies produce the drugs he sells under each Drug Code. Design and produce a report that presents all the quarter's transactions sorted by Drug Code. Within each Drug Code, sort alphabetically by Supplier. Include all appropriate fields including Drug Name and Supplier.
5. Richard has been frustrated by the slow delivery of supplies by Roche. The Roche sales representative is coming to visit next week and Richard will raise the subject. Richard would like to prepare for the visit by finding out how much of Roche's products he actually uses. Create and print out a report of all the prescriptions Clifford Pharmacy dispensed when the drug was provided by Roche. He would like this list sorted by Drug Code with sub-total usages included for each class.
- \*6. ChemTech has extended their pharmacy system. The new system is compatible with several Windows-based database packages including Access. The system is menu driven, and the pharmacist just selects which operation is required. Menu options include, "Enter a New Customer" and "Fill Prescription." The system has four main data files: customer, drug information, inventory, and transaction records.

The customer enters the store and gives the prescription to the pharmacist or shop assistant. The pharmacist goes to the computer and checks whether the customer is on file. If not, customer details are entered; otherwise, the customer's record is located by the system. Prescription details are then entered. A check automatically occurs to ensure that the new drug does not interact with any medication currently used by the customer.

The pharmacist then fills the prescription, the inventory level for that drug is adjusted downwards, a sticky label prints out, and a record is added to the transaction database. The transaction database is just a log of every prescription issued. A repeat script is printed if required, and a detailed customer receipt printed for insurance purposes.

Draw a data flow diagram (first-level only) describing ChemTech's new system. Include the major processes, data files, data flows, system outputs and people involved in the system. Identify all the fields in each of the data files.

At the end of each week, a number of management reports are produced. Suggest what you think these reports will be, and what fields they are likely to contain.

Information on producing data flow diagrams is contained in most information systems texts. Our reference is: *Essentials of Management Information Systems: A Contemporary Perspective*, K.C. Laudon & J.P. Laudon, 1996, Prentice Hall.

#### Time Estimates (excluding task marked \*)

Expert: 30 minutes

Intermediate: 1.5 hours

Novice: 2.5 hours

## Tutorial for Database Case 4 Using Access 2002

### How to Create Record Groups in Reports

For many reports, sorting the records isn't enough; you may also want to divide them into groups. A *group* is a collection of records that share a common characteristic, such as the same Product Number or the same ZIP Code. In Access, a group consists of a group header, a series of detail records, and a group footer.

Grouping enables you to separate records of groups visually, and to display introductory and summary data for each group. For example, the report extract shown below groups sales by date and calculates the total amount of sales for each day.

Data Grouped by Date			
Delivery Date:	Invoice No.	Company	Sale Amount
11-Nov-2001	10423	Hungry Macs	\$1,323.34
	10425	Barnacle Jill	\$2,457.40
	10426	Blue Rooster	\$161.18
	10428	Hot Chippis	\$741.88
Total for 11-Nov-2001			\$4,683.80
14-Nov-2001	10441	Chicken 'n' Chips	\$1,074.20
Total summarises the Group			Sales sorted by Invoice No.

Let's produce a report with groups using the FRIENDS database and the Report of My Friends report created in the Tutorial for Case 2. We want to group the report by State to produce a listing of friends sorted alphabetically (ascending order) by state. For friends in the same state, we want to sort these alphabetically by Last Name. Before we can do this, we need to make some modifications to the existing FRIENDS table. Open the practice database FRIENDS.MDB.

1. With the FRIENDS Database window on the screen, click *Tables* on the Objects bar, and double click the FRIENDS table. Add the five new records shown in Figure 5-24 to the table, making sure that some of the state names you enter in the State field duplicate those of existing records (see Figure 5-49). To speed up this

procedure, just enter the new records with the Title, Last Name, First Name, Street, City and State fields.

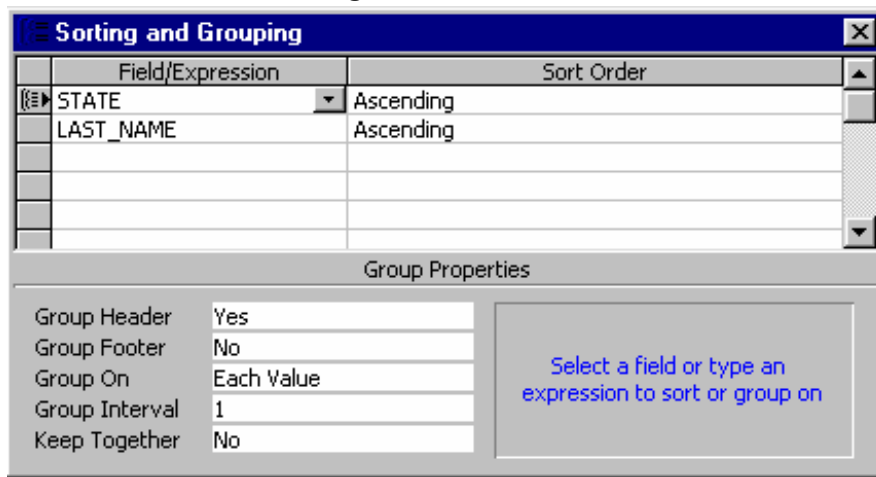
Figure 5-24


TITLE	LAST_NAME	FIRST_NAME	STREET	CITY	STATE
Mr.	Jones	Timothy	89945 Marydale Lane	Starkey	New Hampshire
Mr.	Kaufman	William	7654 Flamton St.	Milwaukee	Wisconsin
Mr.	Kohlman	Frank	35 Miller Drive	Milwaukee	Wisconsin
Mr.	Nelson	Robert M.	1 Franklin Ave.	St. Louis	Missouri
Ms.	Parker	Gina	640 Palm Tree Lane	Phoenix	Arizona
Mr.	Peterson	Jack S.	54 Elmor Ave	Barston	Ohio
Mr.	Roberts	James	567 Ridge Rd.	Columbus	Ohio
Mr.	Salione	Phillip	35 Truesdale Ave	Phoenix	Arizona
Mr.	Sitkin	Howard W.	17 Morace Street	Springvale	New Hampshire
Dr.	Skalek	William F.	8 Yorkshire Place	Teatown	South Dakota
Mr.	Tedesco	George R.	346 Skytop Drive	Spokane	Washington
Mr.	Thompson	Howard	799 Tucker Ave.	Blakeley	Wisconsin
Dr.	Timko	Rebecca	34 Salem Ave.	Spokane	Washington
Mr.	Whitney	Craig	25 Wood Lake Road	Morris	New Jersey
Mrs.	Williams	Emily	678 National Pike	Baltimore	Maryland
Mrs.	Zito	Helen K.	64 Albany Post Rd.	Dana	Maryland
Mr.	Eddy	Steven	12 Hedge St.	New York	New York
Ms.	Satchel	Simone	111 Eagle Ave.	Green Bay	Wisconsin
Mr.	Sorini	Roberto	4 Capital Ct.	Tuscon	Arizona
Ms.	Nation	Diana	90 Buzzard Rd.	Winslow	Arizona
Mr.	Henderson	Henry	278 Seaspray Dr.	Manchester	New Hampshire


Record: 22 of 26

- Press F11 to return to the Database Window.
- Click *Reports* on the Objects bar, and select the *Report of My Friends* report you created in Tutorial 2. Click the *Design* button to open the report in Design view.
- Click the Sorting and Grouping button, or select VIEW/SORTING AND GROUPING to open the Sorting and Grouping dialog box.
- Click in the first cell in the Field/Expression column and change the primary sorting criterion from City to State. In the Group Properties section at the bottom of the dialog box, click in the Group Header box and change the default property setting to *Yes*.
- Click in second cell in the Field/Expression column immediately under State. Click the list arrow and select Last Name as the secondary sort criterion. Leave the Group Header for Last Name set to *No*. Accept the default ascending sort order for both fields. The settings in the Sorting and Grouping dialog box are displayed in Figure 5-25.

Figure 5-25



7. Exit the Sorting and Grouping box by clicking on the  box in the top right hand corner, and return to Report Design view. You should notice that a blank *State Header* area has been added to the report design.

8. Select VIEW/FIELDLIST or click the *Field List* button  on the Report Design toolbar to activate a scrollable field list for the FRIENDS table, if not already activated. Select the State field in the field list. Drag the State field to the State Header and position it against the left margin. Two boxes, a label box and a text box, are inserted. Select the label and delete it. (You must use the move handle in the upper-left corner of the label to move it from on top of the text box first. A pointer with one pointing finger will display when you have correctly positioned the mouse over the move handle. Click the label to select it and press [Delete] on the keyboard)

9. Double click the State text box to open its property sheet. Click the *Format* tab, if necessary. Scroll down the list and change the *Font Size* property to 14 and the *Font Weight* property to **Bold**. Close the property sheet and resize the text box to suit the changes. Your screen should look similar to Figure 5-26.

10. Click the *Print Preview* button or select FILE/PRINT PREVIEW to see the effect that the changes have had on the report. Return to Design view and increase the size of the State text box if necessary to accommodate the lengths of the state names. When you have completed the change, return to Print Preview. If your report appears in *Landscape* orientation, select FILE/PAGE SETUP from the menu to open the Page Setup dialog box. On the *Page* tab, change the orientation to *Portrait*. Print the report.

Your report should display the FRIENDS records grouped alphabetically by State, and within each group, ordered alphabetically by Last Name.


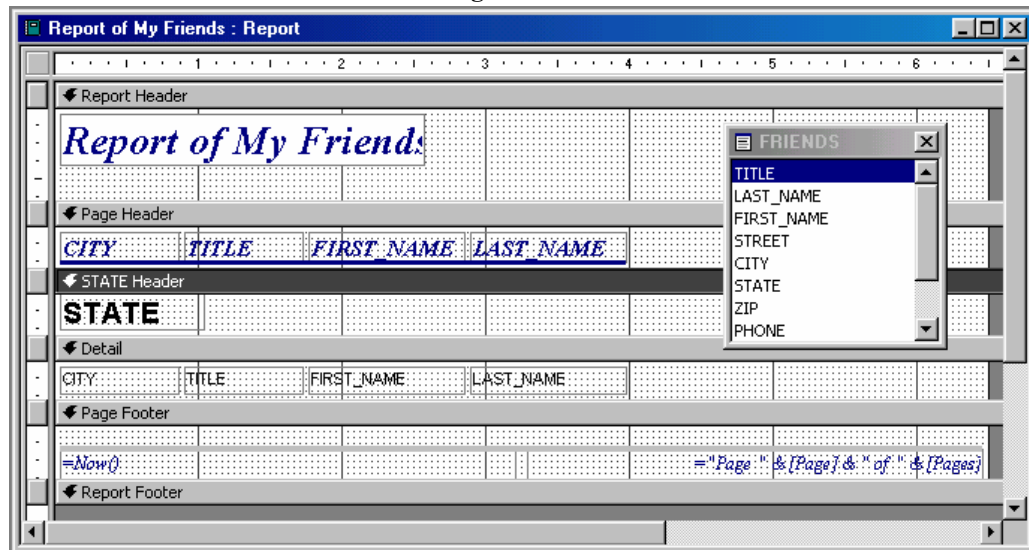
11. Save the report with a new name (e.g.: *Tute4Report1*) by selecting FILE/SAVE AS from the menu. Click the *Close* button  on the Print Preview toolbar to return to Report Design view.

Figure 5-26



### Calculating Group Summary Statistics

You often will want to ask questions about groups of data such as “How many orders did we receive this month?” or “What’s the average price of all the products in our Toothpaste category?” You can perform calculations on groups of records in reports or queries. The following table shows some of the types of *functions* (calculations) you can use with Access (refer also Access Tutorial for Case 2)

Use This Type of Calculation	To Find
<b>Sum</b>	the total of values in a field
<b>Avg</b>	the average of values in a field
<b>Min</b>	the lowest value in a field
<b>Max</b>	the highest value in a field
<b>Count</b>	the number of values in a field (not including null values)

Let’s use the *Count* function to count the number of friends we have in each State, and display that number at the end of each group in our report.

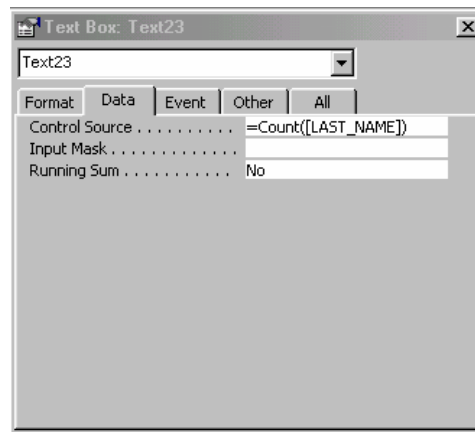
1. In Report Design view, click the Sorting and Grouping button or select VIEW/SORTING AND GROUPING to reopen the Sorting and Grouping dialog box.
2. Click in the first cell in the Field/Expression column where State is entered as the group to sort by, and then click in the Group Footer property settings box and change the default to *Yes*.
3. Exit the Sorting and Grouping box by clicking the ☒ box in the top right hand corner, and return to report design view. You should notice that a blank *State Footer* section has been added to the report design.
4. Select VIEW/FIELDLIST from the menu or click on the *FieldList* toolbar button (displayed at right) to activate the scrollable field list for the



FRIENDS table if necessary. Select the Last\_Name field in the field list. Drag the Last\_Name field into the State Footer and position it. Use the move handle to move the label from on top of the text box and delete it.

- Double click the Last\_Name text box in the State Footer to open its *property* sheet. On the *Data* tab, edit the *Control Source* property to include the Count calculation (see Figure 5-27). Be careful with the syntax here and with the entering of round and square brackets. When you use a function, you must enclose the expression on which it is being performed in parentheses. All field names must be enclosed in square brackets, as learned previously. Close the property sheet.

Figure 5-27



- Click the Print Preview button or select FILE/PRINT PREVIEW to see the effect of this change on your report. Results should resemble Figure 5-28. Print your report.

Figure 5-28

<i><b>Report of My Friends</b></i>			
<u>CITY</u>	<u>TITLE</u>	<u>FIRST_NAME</u>	<u>LAST_NAME</u>
<b>Arizona</b>			
Winslow	Ms.	Diana	Nation
Phoenix	Ms.	Gina	Parker
Phoenix	Mr.	Phillip	Salione
Tucson	Mr.	Roberto	Sorini
			4
<b>Illinois</b>			
Chicago	Ms.	Denise	Buckley
Chicago	Mr.	James T.	Fabian
Chicago	Mr.	Kevin	Hicks
			3
<b>Maryland</b>			
Baltimore	Mrs	Emily	Williams



7. Save the report with a new name (e.g.: *Tute4Report2*) by selecting FILE/SAVE AS from the menu. Press [F11] to return to the Database Window.

**Deleting Records in Access**

To delete a record in an Access table, highlight the record row intended for deletion, and press either the [Delete] key or select EDIT/DELETE. Access will ask you to confirm your action. Click the OK button to proceed with deletion of the record.