Database Case 2

Werner, Schmidt, Dawkins & Kindrey
Attorneys-at-Law

Problem:	Construct a Personnel Database
Management Skill:	Coordinate
Access Skills:	Table Setup
	Data Input
	Select Queries
	Report Design
	Printing
Data Table:	WSDK

Werner, Schmidt, Dawkins & Kindrey (Werner Kindrey for short) is a large legal practice with offices in Newark, Princeton, and Trenton, New Jersey, specializing in corporate law. The Werner Kindrey Princeton office employs more than 85 freelance and contract personnel, including expert witnesses (EW) from various fields and disciplines, private investigators (PI), process servers (PS), and legal researchers (LR). These people are hired on an as-needed basis to assist in the conduct of cases on behalf of the many client corporations the firm represents.

Werner Kindrey has 38 Principal attorneys who are also the main partners in the firm. Each Principal has a staff of assistant lawyers. In addition, all Principals keep separate lists of contractors and freelancers with whom they have worked successfully in the past. Typically, these lists reside on 3" x 5" cards in a file cabinet in each partner's office. Whenever a client's case requires certain outside expertise, the partners reach for these cards and select their favorite people.

The partner's remuneration is based in part on their performance—the more successful cases they litigate, the more money they make. Moreover, the more experienced and competent freelancers they know, the more likely they are to successfully litigate, and thus the more likely that attractive clients will seek them out for assistance. In this environment, there is a natural tendency to safeguard the names of good freelancers and contractors for one's own accounts. However, there is also the likelihood that by sharing this information, the firm's overall success would increase and everyone would benefit.

Eton Werner started the law firm 24 years ago with fellow Princeton University graduate Henri Schmidt. Werner knows how the freelancing system works. The problem is that each attorney squirrels away the names of the people that he or she thinks are really excellent. When it comes to the talent pool, there is no sharing among attorneys. Second-rate people may be used on a case because the names of the first-rate people are only known by one or two attorneys. If a partner hires a poor freelancer, and the verdict on a case goes against the interests of a client, the client may be inclined to look for new legal representation in the future, and thus the firm's profits and reputation suffer.

Werner wants to establish some sort of centralized repository for this information. Too much time is wasted searching for people with particular skills or knowledge that may already be known to some of the partners. The central repository could also contain comments on the performance of the freelancer or contractor on prior occasions and other relevant data. Werner would like some sort of scoring system so that freelancers and contractors could be rank-ordered. This would ensure that only the best people would be hired to work with the firm.

The partners are not happy with this idea. Sharing these resources with the other partners may mean that their favorite people will be unavailable when they need them most. On the other hand, a central repository might help them find new resources for assistance about whom they did not previously know. Therefore, with somewhat mixed feelings, the partners have agreed to support the proposal to build a central repository of contractors. They have responded to a memo sent out by Werner asking them to list the resources they would like to have stored in a central database.

The following fields were identified: First and Last Name, Skill, Hourly Rate, Number of Hours Employed for Each Quarter of 2005, Phone Number, Rating (Excellent, Good, OK, or Poor) and Initials of the Rater. Werner reviewed the suggestions and added a field to store an additional free form text comment about each freelancer.

Parts of this database have been identified in the table WSDK in the SOLVEIT_5.MDB database. Create a new Access database and import this table now.

Tasks

There are seven tasks in this case:

1. Complete the design of the table to store the rating system devised by Werner. Be sure to devise a way to limit the rating field to only 4 categories and to record free-form text remarks from the attorneys.

2. Fabricate and enter hours worked for the existing freelancers or contractors. Enter data for three new freelancers or contractors, such as private investigators (PI), process servers (PS), legal researchers (LR), or expert witnesses (EW). Enter data for at least the first three freelancers in the comments field. Use your initials for the partner who is contributing the remarks.

3. Create a query that shows the contractors sorted first by their skill, then by their rating, and then by their name. Include the comment field and print the results of this query.

4. Create a report to list all the freelancers and contractors with just the following fields: Last Name, First Name, Hourly Rate, the Total Number of Hours Worked, and the Total Amount Earned in 2005. Print the report.

5. Produce and print a report to list all expert witnesses who charge more than $250.00/hour. Include in this report the total number of hours this group of freelancers worked for Werner Kindrey in 2005. Print the report.

*6 There are several areas where this system can be enhanced and improved. (What will happen next quarter? What if two partners have the same initials?) Make a list of all of the improvements you would make, and then pick one and implement it into the database.

*7.   Currently, with the comments in a Memo field, no analysis or data manipulation can be performed using the ratings of the freelancers. There may also be conflicting opinions on the merits of any one freelancer if they have worked for more than one partner. Devise a method to accommodate these differing opinions in such a way that meaningful analysis can be performed. Note that this may mean redesigning the database.

Time Estimates (excluding task marked with an *)

Expert: 45 minutes

Intermediate: 1.25 hours

Novice: 2 hours

Tutorial for Database Case 2 Using Access 2003

In the previous case, you learned to use Table Design view to change the structure of a table by adding new fields and setting field properties, and how to use Datasheet view for adding and editing records. This case introduces the *memo* data type and *report design*. Start Access and open the FRIENDS table you used for the Case 1 tutorial to practice the skills you will need for this case.

Using Memo Fields

Memo fields are used in tables to store free form text and notes. You use a memo field to store descriptive or narrative information and even large documents. A memo field can hold up to 65,536 characters of text. Creating, entering, and saving data in an Access memo field is a very simple procedure. Because of their unstructured nature, memo fields cannot be *indexed* or *sorted*, but they can be searched. We will look at indexing, sorting, and searching in later cases.
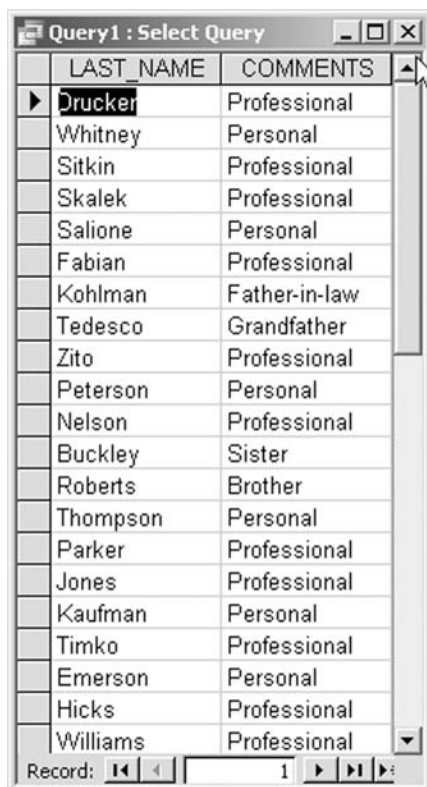
1.   Open the SOLVEIT_5 database. Double-click on the FRIENDS table to open it in Datasheet View. Click the Design View button ⬚ or select *View/Design View*.

2.   Let's add a new field to the end of the existing table. The name for the new field will be COMMENTS and the data type will be *Memo*. (Review the tutorial for Case 1 if you are unsure how to add new fields and select data types.) Notice that the Field Size cell in the Field Properties pane does not appear when you select the memo data type. Save the changes to the table structure by clicking the *Save* button or selecting *File/Save*.

3.   Return to Datasheet view by clicking the Datasheet View button ⬚ or by selecting View/Datasheet View. Scroll or Tab over to the new COMMENTS field and enter text for each record to describe their relationship (e.g. personal or professional friend, family member, or a specific familial relationship). Press the down arrow key on the keyboard to move to each new record. (Remember that as you move to a new record, Access automatically saves the data.)

Printing Memo Fields

Memo fields can be printed like any other field in a table or query. To create a query that will select only certain fields in the table, including the memo field:

1.   In Datasheet view, press [F11] to view the Database window. Click *Queries* on the Objects bar. Click the *New* button on the Database window toolbar. In the New Query dialog box, select Design View if necessary and click OK. In the Show Table dialog box, with the FRIENDS table selected, click *Add* and then *Close*.

2.   In the FRIENDS field list, select the Last_Name and Comments fields and drag them to the design grid. Release the mouse button when the selected fields symbol is over the first *Field cell*.

3.   Click the *Run* button or select *Query/Run* to display the data in the Last_Name and Comments fields (see Figure 5-9).

4.   Click the *Print* button or select *File/Print* to open the Print dialog box, and then click OK to print the query. Select *File/Close* and click No when a warning dialog box asks if you want to save the changes to the design of Query 1. This will return you to the Database window without saving the query.

Figure 5-9

LAST_NAME	COMMENTS
Drucker	Professional
Whitney	Personal
Sitkin	Professional
Skalek	Professional
Salione	Personal
Fabian	Professional
Kohlman	Father-in-law
Tedesco	Grandfather
Zito	Professional
Peterson	Personal
Nelson	Professional
Buckley	Sister
Roberts	Brother
Thompson	Personal
Parker	Professional
Jones	Professional
Kaufman	Personal
Timko	Professional
Emerson	Personal
Hicks	Professional
Williams	Professional

Creating Reports in Access

A more polished look can be achieved by creating an Access report. *Reports* are the database objects in Access specifically designed for printing. Reports can be based on tables and/or queries. They are used to provide subtotals and grand totals for numeric fields, and to produce summaries of information contained in the database, mailing labels, and presentation quality display of your data. Report Wizards speed up the creation, display, and printout by providing a series of dialog boxes to help you determine the data you want the report to contain, as well as a group of popular style templates from which to choose.

The items on a report that contain the data for display and printing are called *controls*. Different types of controls are used to display data of the various data types. Controls are used to display data from fields, along with the labels that identify this data and the results of calculations for report headers and footers that will print identifying information at the top and bottom of every page of the report, as well as group footers that identify a particular group of related data. Report controls can also be used to include graphs, pictures, and other Access objects.

1.   With the Database window on the screen, (press the [F11] key to display it if necessary) click *Reports* on the Objects bar, and then click *New* on the Database window toolbar. In the New Report dialog box, click the list arrow 🔽 on the *Choose the table or query where the object's data comes from* box. Select FRIENDS (See Figure 5-10). This action tells Access that the record source for the report will be the FRIENDS table.

2.   The New Report dialog box enables you to create a new report in Design View or with the Report Wizard, two different types of AutoReports, or reports using the Chart Wizard or the

Figure 5-10

Label Wizard. Click each one to read a brief description of the type of report it will create. Select *Report Wizard* and click the *OK* button shown in Figure 5-10.

3.   The first Report Wizard dialog box opens. Here you can choose the fields that you want to display in the report and decide the order in which you want them to display. Select four fields, Title, First_Name, Last_Name, and City, for inclusion in the report. With the Title field selected in the *Available Fields* box, click the ⟨ > ⟩ button to add it to the *Selected Fields* box (refer to Figure 5-11). Next, select the First_Name field in the Available Fields box and click ⟨ > ⟩ again to add it to the list of selected fields. Follow the same procedure to add the remaining two fields as shown in Figure 5-11. (If you accidentally add the wrong field to the report, select the unwanted field and click the ⟨ < ⟩ button to return it to the Available Fields box.) When you have finished, click the Next button.

4.   The second of the six Report Wizard dialog boxes opens. Here you can add grouping levels for the data in your report based on one or more fields. Data can be grouped by City, for example, so that all contacts that live in a particular city will be grouped together in the report. Click *Next*. In the third dialog box, you can impose a sort order on the data in the report based on one or more fields. Select City in the first sort order list box and then click *Next*.

Figure 5-11

5. In the fourth dialog box, you can choose the layout for the report. Option buttons are provided to choose either Po*rtrait or Landscape* orientation for the report and a *Columnar*, *Tabular*, or *Justified* layout. Select the *Tabular* layout if necessary, make sure the *Adjust the field width so all fields fit on a page* check box is selected, and click *Next*.

6. In the fifth dialog box, you can select a style for your report. Select *Corporate* if necessary and click *Next*.

7. In the final dialog box, you can enter a title for your report. By default, Access enters the name of the table or query that serves as the record source for the report as the title name, which in this case is FRIENDS. Type *Report of My Friends*.

8. Click the *Finish* button. Access will generate the report and open it in Print Preview. Note that the records are displayed alphabetically by City according to the sort order selected in the Report Wizard. Click the *Print* button on the Print Preview toolbar or select *File/Print* to open the Print dialog box, and then click OK to print the report. Close the report.

How to Use Reports to Display and Print Selected Fields

You can change the record source for an existing report, which will, in turn, change the records the report displays. For example, you can change the record source for the Report of My Friends report to the second query created in the tutorial for Case 1 (e.g. TutelQuery2). This query filters out all records in the FRIENDS table that do not have the title MR.

1. With the Database window on the screen, click *Reports* on the Objects bar if necessary. Select Report of My Friends if necessary. Click the *Design* button on the Database window toolbar to open the report in the Report Design view window (see Figure 5-12).

Figure 5-12

Figure 5-13
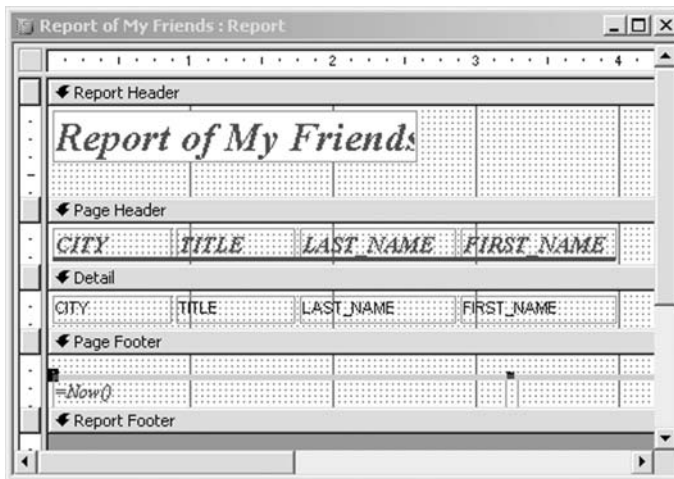
As Figure 5-13 shows, the Report Design view window is divided into sections. The **Report Header** prints once at the beginning of the report. It generally contains the report's title. The **Page Header** prints at the top of every page in the report and contains the labels or column headings. The **Detail** section contains the records that are being displayed in the report. The **Page Footer** prints at the bottom of each page and often contains calculated controls that display the current system date and time, along with the page number and total number of pages in the report. The **Report Footer** prints once at the end of the report. It often contains calculated controls that summarize or total the data contained in the report. Additionally, group headers will be automatically added to a report in which records are grouped based on like values. You can add group footers to include summary information about the group such as *Count*, *Sum*, or *Average*. We will look at report groups in a later tutorial.)

2.   Click the *Properties* button [icon] on the Report Design toolbar to open the property sheet for the report. Report properties define the data source for the report, as well as its overall appearance.

3.   Click the *Data* tab on the property sheet if necessary. Click in the *Record Source* property settings box and click the list arrow [icon] to open a list of the available data sources in the FRIENDS database. Select the second query you created in the Case 1 tutorial (e.g. Tute1Query2) to change the record source for the report. (See Figure 5-14.)

4.   Close the property sheet by clicking the [×] in the top right corner.

5.   Click the *Print* Preview button [icon] or select *File/Print Preview* to view the new report. A reduced data set displays based upon the criteria set up in the query, but the sort order based on the City field and the report style selected in the Report Wizard remain.

Figure 5-14
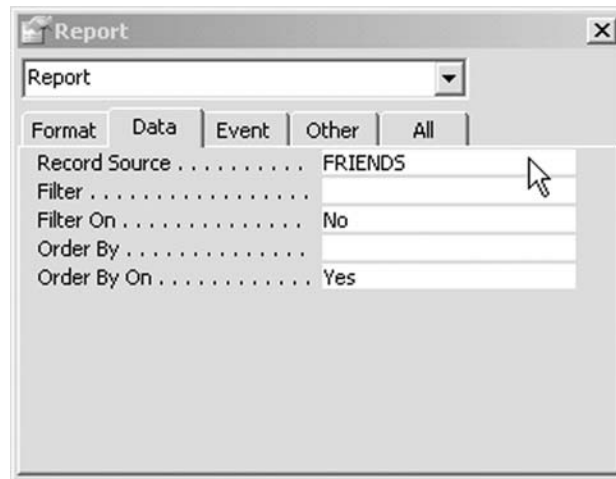
6.   Click the *Print* button to print the new report.

7.   Select *File/Save* As to open the Save As dialog box. *Type: Tute2Report2* in the top text box and click *OK*. Close the report and the FRIENDS database.

Using Expressions in Reports

Expressions are used to create calculated controls for a report. Calculated controls are used to display the results of expressions that can be built using Access functions, mathematical operators, raw values, and any values contained in the fields in the report. For example, the expression = **[UnitCost]*[Quantity]** multiplies the contents of the two fields with these names and displays a single value as the result. A *function* is a predefined formula that helps simplify the process of building expressions. For example, the function *Sum* will add all of the values specified. The *Now* function in the Page Footer section, shown in Figure 5-12, returns the current date as stored in your computer's system clock.

       You can create calculated controls using expressions in one of three ways:

•   By typing an expression directly into a text box control

•   By entering an expression into the Control Source property for a control

•   By using the Expression Builder to help you to create the expression

       To learn and practice the skill of creating calculated controls using expressions, we will use the first method and the sample table HARDWARE provided on SOLVEIT_5.MDB. First, create a new empty database (e.g., HARDWARE.MDB) and then import the HARDWARE table.

1. Open the HARDWARE.MDB database. (If you still have tables or reports open from the FRIENDS database, save and close them, and close the FRIENDS database.)

2. Double-click the HARDWARE table to open it in Datasheet view. There are four fields: Invoice, Item, UnitCost, and Quantity. Press [F11] to view the Database window.

3. Click *Reports* on the Objects bar and use the Report Wizard to create a new report using the HARDWARE table as the record source. Include the fields Invoice, UnitCost, and Quantity. Sort the records by Invoice number, use the Tabular layout and the Corporate style, and give the report the title *Calculating Total Cost*. Click *Finish*. The report is generated and opened in Print Preview.

4. Click the Close button on the Print Preview toolbar to switch to Report Design view.

5. Widen the working area for your report by extending the margins. Position the mouse pointer over the right margin of the report area. When the horizontal resizing pointer appears (see Figure 5-15), drag to the right to widen the report area to the 7-inch mark on the horizontal ruler.

6. A calculated control contains an expression and displays the result of that expression when the report is opened. To practice creating a calculated control, multiply UnitCost by Quantity. Since this calculation will use the values in two existing fields to calculate a new value, we must create a control to display the new value.

7. Click the *Toolbox* button ⚒ on the Report Design toolbar to open the Toolbox if necessary. Click the *Text Box* button [abl] in the Toolbox. Click once with the Text Box pointer at the 4-½-inch mark on the horizontal ruler in the *Detail* section of the report. An unbound text box control and a label control to identify it are added to the report. The label caption (*Text 11*) will vary depending on the number of controls on the report. Click the label

Figure 5-15
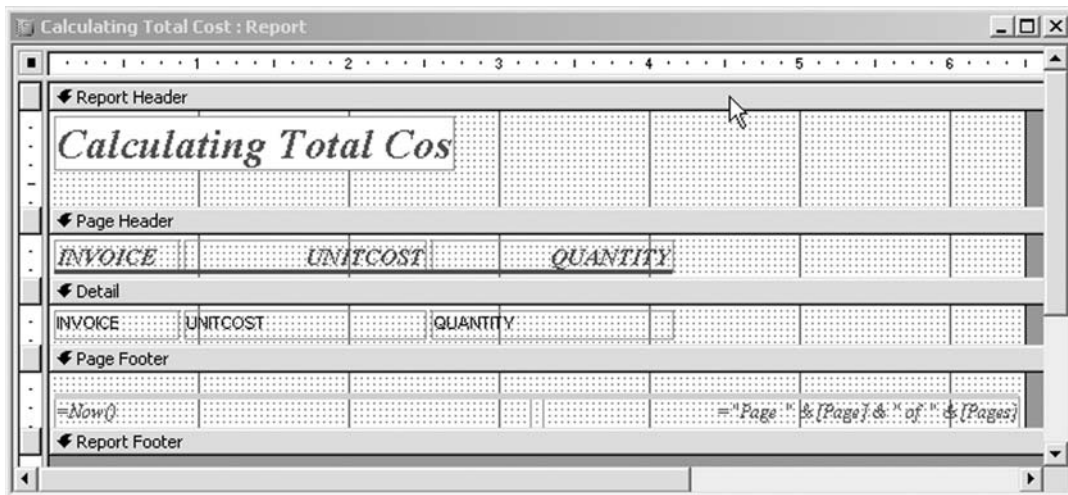
control to select it and press the [Delete] key on the keyboard. You will add a label for the calculated control to the page header later.

8.   Unbound controls are not linked to any existing field in the record source or sources for the report. They are used to display the results of calculations, text, or graphics. Click inside the unbound text box to get a blinking insertion point (called an *I-beam*). Type **=UnitCost*Quantity** and press the [Enter] key. Access automatically adds the correct syntax for you by enclosing each field in square brackets. Access is not case sensitive, so it does not matter if you enter your field names in upper or lowercase. You must, however, spell them correctly and use the correct spacing!

Note: If the field names contain spaces, you must enclose them in square brackets because Access will not recognize them as field names (e.g. [Time to Market]).

All expressions in Access must begin with an = sign. The asterisk is used to denote multiplication. A listing of other operators and functions used in Access is presented at the end of this tutorial.

9.   You have now created a calculated control. The Detail section of your report should resemble Figure 5-16.

10.   You will now add a label control to the page header to identify the calculated control. Click the *Label* button ⎡*Aa*⎤ on the toolbox. Click the Label pointer once in the *Page Header* section of the report at the 5-inch mark on the horizontal ruler. Type TOTAL.

11.   Double-click the calculated control to open the property sheet for the control. Click the Format tab. Click in the *Format* property settings box. Click the list arrow and select *Currency* on the list. Close the property sheet, decrease the width of the report back to the 6 ½-inch mark on the horizontal ruler, and switch to Print Preview. Your report should look similar to Figure 5-17. Save the changes and close the report.
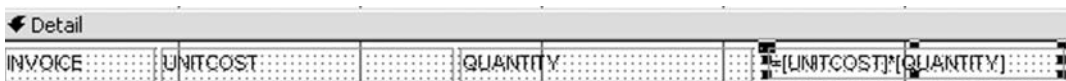
Figure 5-16

Figure 5-17

Calculations in Queries

A more rapid way of achieving the same result is to create a query that includes the calculated field you want to display in the report and then to use the query as the record source for the report.

1.   In the HARDWARE database window, click *Queries* on the Objects bar. Double-click *Create query in Design view*. Add the field list for the HARDWARE table to the Select Query window and close the Show Table dialog box. Drag the 3 fields—Invoice, UnitCost, and Quantity—to the design grid.

2.   In the fourth Field cell, type **TOTAL: =[UnitCost]*[Quantity]**. Your query window should look like Figure 5-18.

3.   Click the Properties button on the Query Design toolbar to open the properties sheet for the calculated field. On the General tab, click in the *Format property* settings box. Click the list arrow and select *Currency*. Close the property sheet.

4.   Click [!] to run the query. Save the query as *CalculatingTotalCost*, and then create a report using the query as the data source for the report

Figure 5-18
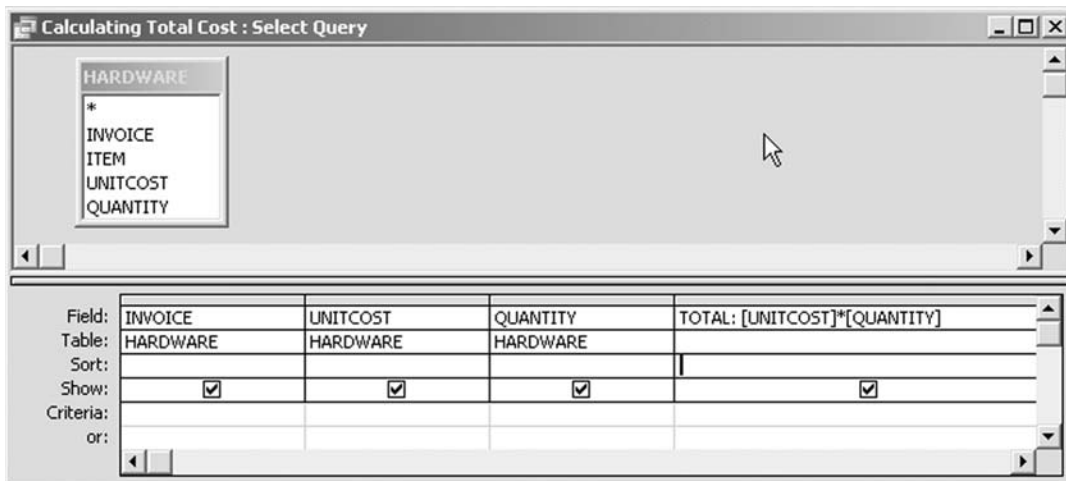
Expressions can play many roles in Access, and they can be used in virtually every type of database object. For example, you can use expressions in Table Design view to define default values for fields. In queries, expressions can be used to create calculated fields and criteria. The table below lists only those likely to be used in *Solve it!* For a more complete list, consult the *Office Assistant*, or search the *Help* facility using the term *operators*.

Arithmetic and Text	
^	Raise one number to the power of the other (exponentiation)
*	Multiply two numbers
/	Add two numbers
+	Divide two numbers
-	Subtract two numbers
Mod	Divide two numbers and return the remainder
&	Concatenate: join two strings of text
Comparison	
< and <=	Less than; less than or equal to
> and >=	Greater than; greater than or equal to
= and <>	Equal to: not equal to

Logical	
And	Both comparisons are True
Or	One comparison or the other is True
Xor	One comparison or the other is True , but not both
Not	The comparison is not True
Miscellaneous	
Like	Text matches a pattern (Use with wildcard symbols ? and *)
Is	Comparison is True (e.g.: is Null)
Is Not	Comparison is not True (e.g.: not Null)

Operators in Access

An *operator* in an expression describes the type of action that the expression should perform or the way in which a comparison between two values should be carried out. Access has four kinds of operators: Arithmetic and Text, Comparison, Logical, and Miscellaneous. The table below classifies, lists, and explains these operators. For a more complete list of operators, consult the *Access 2003 Help* facility.

Date/Time	
Date	Returns current date
Now	Returns current date and time
Logical	
IF	Tests and returns a value based on whether an argument is True or False
Choose	Selects a value from a list based on the content of its argument
Aggregate	
Avg	Average
Count	Count how many
Sum	Sum total

Functions in Access

A function in Access performs a calculation on data and returns the result of that calculation. There are over 100 functions available in Access in eight different categories. The table below lists only

those likely to be used in *Solve it!* For a complete list, consult the Office Assistant or search the Help files using the keywords functions reference.

The Access Form and Report Toolbox

The buttons displayed in the table below appear in the Toolbox used to create labels, text boxes, option buttons, etc. for forms, subforms, and other Access objects.

	Select Objects	Use to select a control, section, or form. Click this tool to unlock a toolbox button that you have locked down.
	Control Wizards	Turns control wizards on or off; Use control wizards to help you create a list box, combo box, option group, command button, chart, subreport, or subform.
	Label	A control that displays descriptive text, such as a title, a caption, or instructions on a form or report; Access automatically attaches labels to the controls you create.
	Text Box	Use to display, enter, or edit data in either a form or report's underlying record source, display the results of a calculation, or accept input from a user.
	Option Group	Use along with check boxes, option buttons, or toggle buttons to display a set of alternative values. For example, you can use an option group to specify whether an order is shipped by air, sea, or land.
	Toggle Button	Use as a stand-alone control bound to a Yes/No field, an unbound control for accepting user input in a custom dialog box, or as part of an option group.
	Option Button	Use as a stand-alone control bound to a Yes/No field, an unbound control for accepting user input in a custom dialog box, or as part of an option group.
	Check Box	Use as a stand-alone control bound to a Yes/No field, an unbound control for accepting user input in a custom dialog box, or as part of an option group.
	Combo Box	Combines the features of a list box and a text box; You can type in the text box or select an entry in the list box to add a value to an underlying field.
	List Box	Displays a scrollable list of values; In Form View, you can select from the list to enter a value into a new record or to change the value in an existing record.

▣	**Command Button**	Use to perform actions, such as finding a record, printing a record, or applying a form filter.
▣	**Image**	Use for displaying a static picture on a form or report. Because a static picture is not an OLE object, you can't edit the image inside Microsoft Access once you've added it to a form or report.
▣	**Unbound Object**	Use to display an unbound OLE object, such as a Microsoft Excel spreadsheet, on a form or report. The object remains constant as you move from record to record.
▣	**Bound Object**	Use to display OLE objects, such as a series of pictures, on a form or report. This control is for objects stored in a field in either the form or the report's underlying record source. A different object displays on the form or report as you move from record to record.
▣	**Page Break**	Use to begin a new screen on a form, a new page on a printed form, or a new page of a report.
▣	**Tab Control**	Use to create a tabbed form with several pages or tabbed dialog box (such as the Options dialog box on the Tools menu). You can copy or add other controls onto a tab control. Right-click on the Tab control in the design grid to modify the number of pages, the page order, the selected page's properties, and the selected tab control properties.
▣	**Subform/Subreport**	Use to display data from more than one table on a form or report.
◣	**Line**	Use on a form or report to emphasize related or especially important information.
▢	**Rectangle**	Use for graphic effects, such as grouping a set of related controls on a form, or for emphasizing important data on a report.
▣	**More Controls**	Adds an ActiveX control (such as the Calendar control) to a form or report; ActiveX controls are stored as separate files.