Database Case 2

Capstone Associates - Attorneys-at-Law

Problem: Construct a Personnel Database

Management skill: Coordinate

Access Skills: Data Table Setup
Data Input
Select Queries
Report Design
Printing

Data Table: CAPSTONE

Capstone Associates (CA) is a large legal practice with offices in San Francisco, Los Angeles, Carson City, Salt Lake City and Phoenix, which specializes in corporate law. CA's Los Angeles office employs more than 300 freelance and contract personnel, including expert witnesses (EW) from a wide variety of fields and disciplines, private investigators (PI), process servers (PS) and legal researchers (LR). CA hires these people on an as needed basis to assist in the conduct of cases on behalf of the many client corporations the company represents.

CA has 39 Principal attorneys who are also the main partners of the firm. Each Principal has a staff of assistant lawyers. In addition, each Principal keeps a separate list of contractors and freelancers they have successfully worked with in the past. Typically, these lists reside on 3" x 5" cards at the back of a drawer in each partner's desk. Whenever a client's case requires certain outside expertise, the partners reach for these cards and select their favorite people.

Because the partners are paid in part on performance, the more successful they are on cases, the more remuneration they receive. Moreover, the more and better freelancers and contractors they know, the more clients will seek them out for assistance. In this setting, there is a natural tendency to conserve the good freelancers and contractors for one's own accounts. However, there is also the possibility that by sharing this information, everyone would benefit.

Andrew Capstone, Managing Partner of CA, started the law firm 30 years ago, and he knows how the freelancing system works. The problem is that each attorney hoards the people they think are really excellent. There is no sharing of the talent pool. Sometimes second rate people are used on a case because only one or two attorneys know first rate persons. If a partner hires a poor freelancer, and the case verdict goes badly, the client may move to another legal firm and CA's profits and reputation may suffer.

Capstone 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 other partners may already know about. The central repository could also contain comments on the performance of the freelancer or contractor on prior occasions and other relevant information. Perhaps some sort of scoring system could be developed so that freelancers and contractors could be rank ordered. That way only the best people would be used to assist the attorneys on cases.

The other partners do not like this idea. One of the ways they look good is by knowing highly capable people on the outside. Sharing the name of good freelancers and contractors with other partners may mean these people will not be available when they need them. On the other hand, a central repository might reveal valuable resources they do not know about.

With somewhat mixed feelings the partners respond to a memo sent out by Capstone, asking them to list the information they would like to have in a central database.

The following fields were identified by summarizing memo responses received: Name, Skill, Hourly Rate, the number of hours employed for each quarter in 1998, and Phone Number. Capstone reviewed the responses to the memo and wanted to add to the database a place for text comments that would incorporate a simple rating system from "excellent" to "good", "ok", and "poor". The last partner the freelancer or contractor worked with could input these details.

Capstone did not know if free form text could be attached to everyone's record in the database, but he knew any software which did not have this capability was not too useful. At least with a centralized manual system on 3" x 5" cards, short notes could be attached to each person's record.

Parts of the database have been identified in the data table CAPSTONE in SOLVEIT.MDB. Create a new Access database and import this object now.

Tasks: There are seven tasks in this case:

1. Complete the design of the database to carry the information specified by Capstone. Be sure to devise some way to record free-form text comments, remarks or ratings from the attorneys.

2. (a) Fabricate and enter hours worked and comments for the existing freelancers or contractors. (b) Enter data for three new freelancers or contractors such as: private investigators (PI), process servers (PS), legal researchers (LR) and expert witnesses (EW).

   (c) Enter data for at least the first three freelancers or contractors in the comments field. Make sure that the author of the comments, the partner, is listed in the field. You will have to make up the name of the partner contributing the remarks.

3. (a) Print out the entire table. (b) Create a query and then print out a listing showing only the last name and comment fields.

4. Design and create a report to list all the freelancers and contractors with just the following fields: Last_Name, Hourly_Rate, and the total number of hours worked in 1998.

5. (a) Produce and print a report of process servers (PS) who charge more than $120.00 per hour. (b) Also include in this report the total number of hours this particular group of freelancers worked for CA in 1998. (c) Print the report.

*6. There are a number of areas where this system can be enhanced and improved. Make a list of all the improvements you would make and then pick one improvement and implement it in the database.

*7. Currently with the comments in a memo field, no analysis or manipulation may be performed upon 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 opinions from different attorneys in such a way that meaningful analysis may be performed.

Time Estimates (excluding task marked with *):

Expert:	45 minutes
Intermediate:	1.25 hours
Novice:	2 hours

Tutorial For Database Case 2 Using Access 97

You have already learned in the previous case how to use the table design view to change the structure of a database and add new fields, and to use the datasheet for adding new records and editing existing ones. This case introduces the *memo data type* and *report design*. Load the file you used for the Case 1 tutorial (CONTACTS.MDB or FRIENDS.MDB) to practice the skills you will need for this case.

Using Memo Fields

Memo fields are very useful in databases for storing free form text and notes, or annotations against particular records. Unlike DOS-based database packages such as dBase III+, creating, entering and saving data in an Access memo field is a very simple procedure. You can store up to 64,000 characters in an Access memo field. Because of their unstructured nature, memo fields cannot be *indexed* or *sorted*, but they can be searched. We will be looking at indexing, sorting and searching in later cases.

1. From the Database Window, click on the Table object and double click on either the ADDRESS or FRIENDS table. From the default datasheet view, click on the table design toolbar button or select VIEW/TABLE DESIGN from the menu.

2. Let's add a new field to the end of the existing database. The name for the new field will be "Comments", and the data type will be Memo. Recap the tutorial for Case 1, if you are unsure how to add new fields and select data types. Notice that the Field Size bar in the properties box does not appear when you select a memo data type, indicating the unstructured nature of this field. Save your changes to the table structure by clicking on the *Save* toolbar button, or selecting FILE/SAVE from the menu.

3. Return to datasheet view by clicking on the datasheet toolbar button, or selecting VIEW/DATASHEET from the menu. Scroll or Tab over to the new Comments field, and enter text against each record (eg: whether the person in question is a Personal or Professional friend). Press the ↓ cursor key on your keyboard to move to the next record. Remember that as you move to a different record, Access will automatically save any changes.

Printing Memo Fields

Memo fields can be printed like any other field in a database. For a quick report including memo fields:

1: From datasheet view, press the F11 key to return to the Database window. Click the *Query object* and click *New*. From the New Query box, click on the *New Query* button, and Access will open up a new query window. From the Add Table box click and highlight the FRIENDS table, and then click *Add*, and then click *Close*.

2. From the FRIENDS *field list*, select and drag the LastName and Comments fields down onto the Field bar in the *QBE Grid* of the query window.

3. Click on the *Run* toolbar button or select QUERY/RUN from the menu to display the contents of the Last Name and Comments fields print (see Figure 5-17)

4. Click on the *Print* button or choose FILE/PRINT to send your query to. Select FILE/CLOSE from the menu and click *No* to the Save Query request to return to the Database Window without saving the query.

Figure 5-17

Query1 : Select Query

LAST_NAME	COMMENTS
Drucker	Professional
Fabian	Professional
Kohlman	Father-in-Law
Nelson	Professional
Peterson	Personal
Salione	Personal
Sitkin	Professional
Skalek	Professional
Tedesco	Professional
Whitney	Personal
Zito	Professional

Record: 1 of 11

Creating Reports in Access

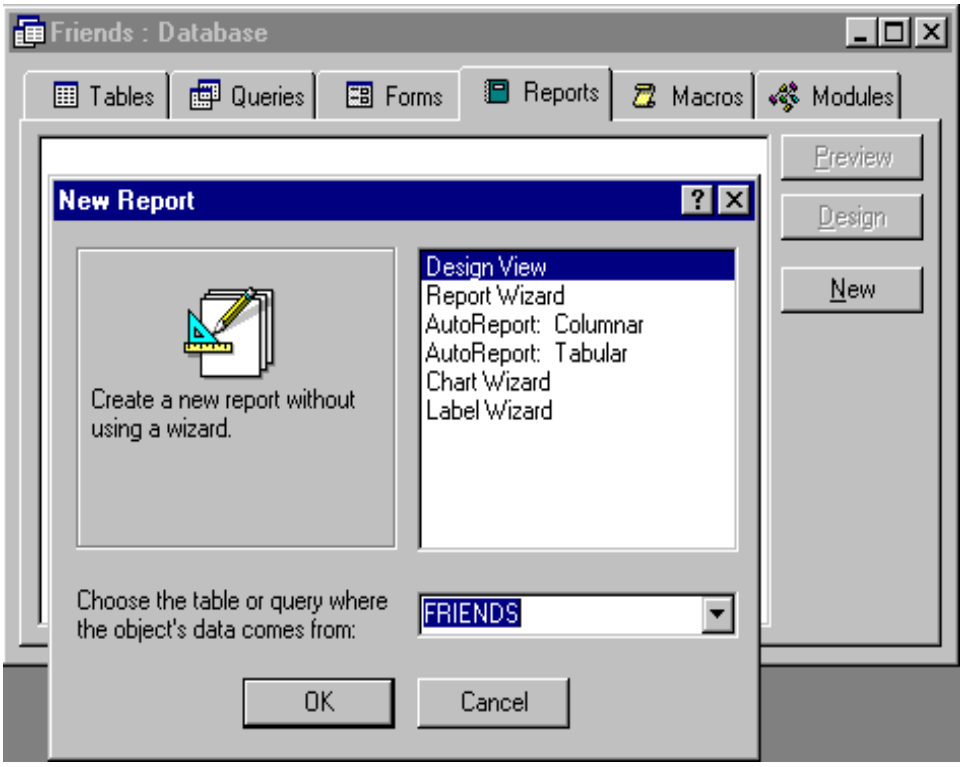
A polished look to your printouts can be achieved using the Access report function. Reports can be based on tables and/or queries, and are used to provide sub-totals and grand totals of numeric fields, and to produce summaries, mailing labels, and presentation quality display of your data. Report Wizards speed up the creation, display and printout of reports by providing a series of popular style templates to choose from.

The items on a report that display or print data are known as *controls*. With a control, you can display data

from fields, calculation results, text for report headings, and include graphs, pictures and other Access objects.

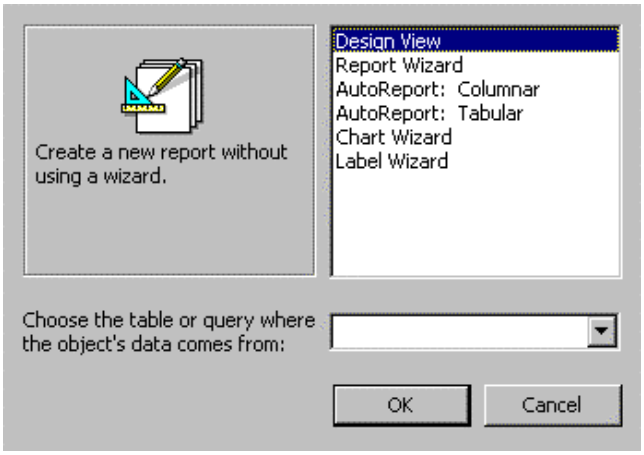
1. From the Database Window (press the F11 key if you are not in this position), click on the *Report object*, and then click *New*. From the New Reports box, click on the ↓ button beneath the *Report Types List*, and click and highlight on *FRIENDS* (see Figure 5-18). This action tells Access that the new report will be based on data contained in the FRIENDS table.

Figure 5-18



2. The *New Report box* allows selection from Design View, the Report Wizard (see Figure 5-19) and four other report templates. By clicking on each one in turn , Access will provide you with a brief description of the type of report each template will produce. Click on *Report Wizard*, and then click *OK*.

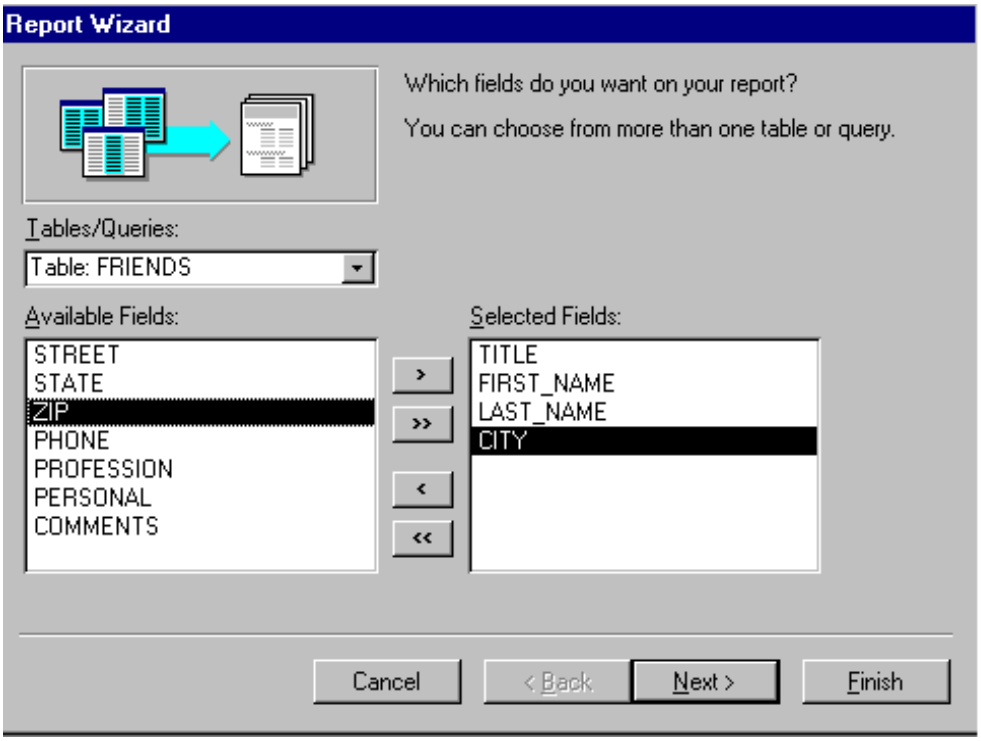
Figure 5-19



3. This drops you into the first of six Wizard setup windows (see Figure 5-20). This first window enables you to choose the fields that will appear in the report, and to decide the order in which they will be displayed. Let's select four fields - Title, FirstName, LastName and City for inclusion in the report.

Click and highlight the Title field in the field list (refer Figure 5-20), and then click on the  button to lodge the field onto the report list. Repeat this action for the remaining three fields, until the *Selected Fields box* looks like the one shown in Figure 5-20. (If you accidently lodge the wrong field in the report list, highlight the unwanted field, and then click on the  button to return it to the FRIENDS field list). When done, click the *Next* > button.

Figure 5-20



4. The second of the six report wizard windows is an optional action, and allows you to add grouping levels for the data in your report based on one or more fields. Click *Next* >. The third of the report wizard windows is also optional, and allows you to impose a sort order on the data in your report based on one or more fields. Select City from the drop down box, and then click on the > button to lodge this into the *Sort order of records*. Click *Next.*

5. The fourth wizard window allows you to determine your report layout. Radio buttons offer a choice between Portrait and Landscape orientation, and Vertical or Tabular Layout. Choose *Tabular*. Also click in the box next to *Adjust the field width so all fields fit on a page,* then click on the *Next* > button.

The fifth wizard window allows you to specify how your report will look when printed out. Styles available are Bold, Casual, Compact, Corporate, Formal, or Soft Gray. For the purposes of our simple report, accept the default by clicking on the *Next* > button.

6. The final report wizard window allows you to enter a customized title for your report. By default, Access enters in a title based on the name of the table or query from which the report is derived - in this case FRIENDS. Type in a new title: "Report of my Friends".

7. Click on the *Finish* button, and Access will proceed to generate the report, and display it in Print Preview mode. Note that the records are displayed alphabetically by City according to the sort order we imposed. Click on the *Print* toolbar button or select FILE/PRINT from the menu to send your report to print.

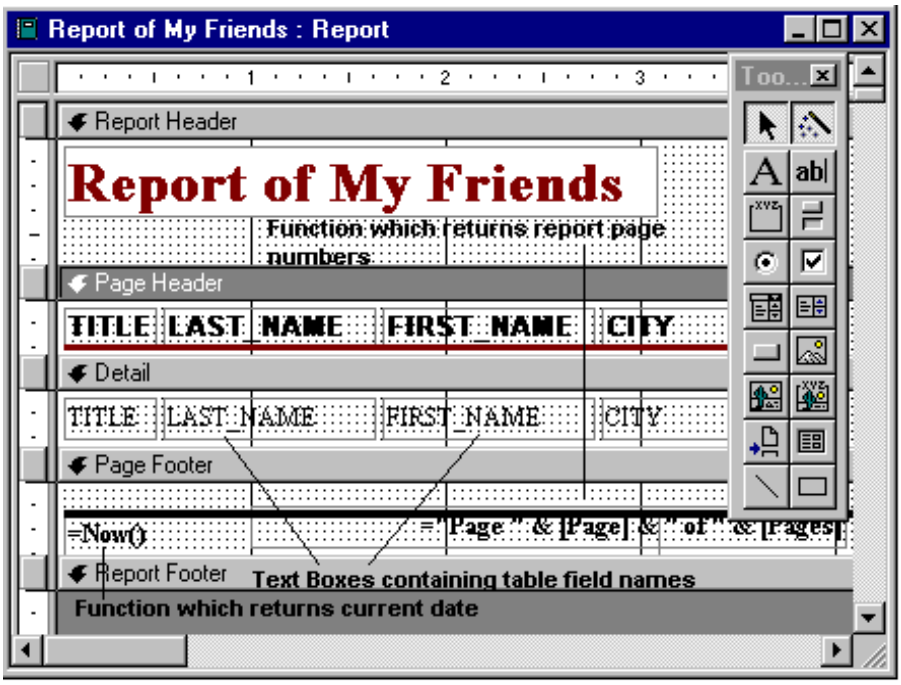
8. Save your report by clicking on the *Save* toolbar button or selecting FILE/SAVE from the menu. Type a name for your report (eg: *Tute2 Repo1*) in the Save As box and click *OK*. Press *F11* to return to the Database Window.

How to Use Reports to Display and Print Selected Fields.

Existing reports can be assigned to tables and/or queries other than the one they were originally based on. Let's say you wanted a report based on the results of the second query created in the tutorial for Case 1 (eg: *Tute1 Query2*). This query filtered out all records in the FRIENDS table that did not have the title of "Mr".

1. From the Database Window, click on the *Report object*, and click and highlight the report we have just created. Click on the *Design* button in the Database Window, and this will drop you into report design view (see Figure 5-21).

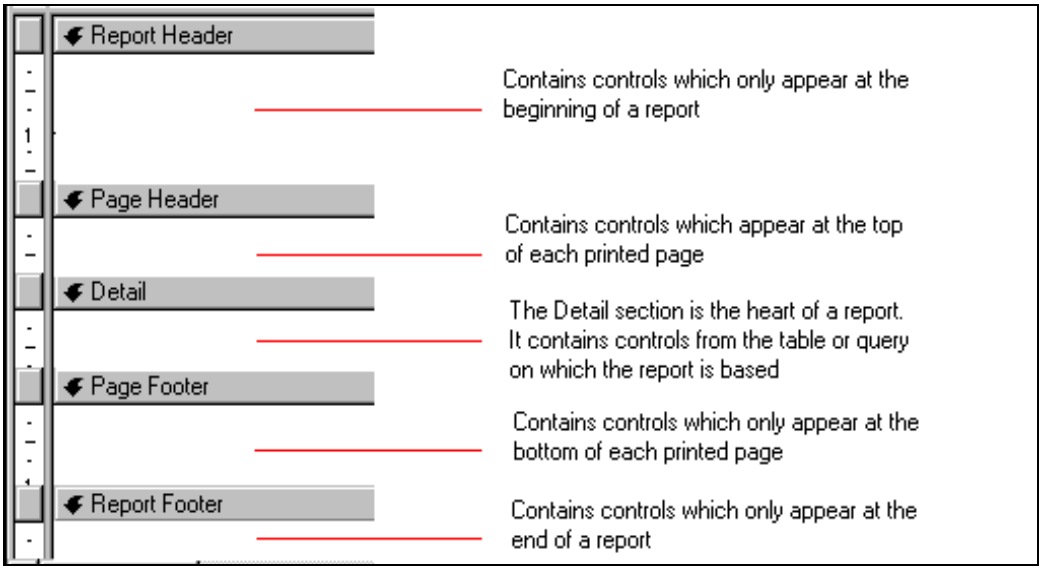
Figure 5-21



The design view comprises two main elements:

- a report design sheet divided into a number of sections. The purpose of each of these sections is briefly described in Figure 5-22
- a collection of control buttons known as a Toolbox. Descriptions for each of these buttons are provided at the end of this tutorial.

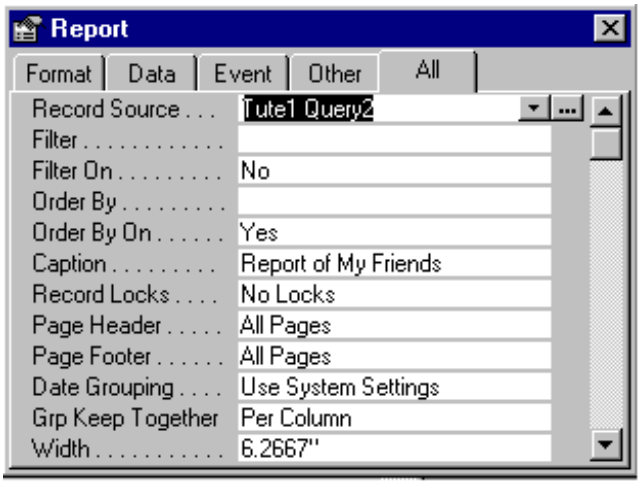
Figure 5-22



In addition to the above, sections can also be defined for headers and footers that are based around *groups* of records with like values. We will be looking at report groups in a later tutorial.

2. From the EDIT menu, choose SELECT REPORT and then click the *Properties* toolbar button, or choose VIEW/PROPERTIES from the menu. This activates the report properties sheet (see Figure 5-23). Report properties define the data source for a report as well as its overall appearance.

Figure 5-23



3. On the properties sheet, click the ↓ button to the right of the Record Source bar. This activates a drop down list of all tables and queries associated with the FRIENDS database. Click on the second query you created in the Case 1 tutorial to change the record source for the report.

4. Close the properties sheet by clicking on the ☒ box in the top right hand corner.

5. Click on the Print Preview toolbar button, or select FILE/PRINT PREVIEW from the menu. This shows a reduced data set as per the requirements of the query, with the sort order of the City field and presentation style imposed by the original report setup.

6. Click on the *Print* toolbar button to send your report to print.

7. Save your report by clicking on the *Save* toolbar button or selecting FILE/SAVE from the menu. Choose a name for your report (eg: *Tute2 Repo2*). Press *F11* to return to the Database Window.

Using Expressions in Reports

Expressions are used to get information that cannot be directly obtained from the tables in a database. An *expression* is a calculation that results in a single value. Expressions are comprised of a combination of operators (such as + and =), constant values, field names and functions. For example the expression, =[UnitCost]*[Quantity] multiplies the contents of two fields, named UnitCost and Quantity, and then displays a single value result. A *function* is a procedure or routine that returns a value. For example, the *=Now()* function shown in the Report Header section of Figure 5-18, returns the current date as stored in your computer's system clock.

Access offers three ways of entering expressions in reports:

- by typing an expression in a field text box (see Figure 5-21)
- by using any control (graphical object) that has a Control Source property; or
- by using the Access Expression Builder.

To learn and practice the skill of entering expressions, we will use the first of these three methods, and the sample data table HARDWARE provided on SOLVEIT.MDB. You will need to create a new empty database (eg: HARDWARE.MDB) and then import the HARDWARE table.

1. Load HARDWARE.MDB. *(Warning: If you still have tables or reports open from the FRIENDS database, you should save them and close them before opening the HARDWARE database).*

2. From the *Table* object, double click to open the HARDWARE table and examine the record contents. There are four fields: Invoice, Item, UnitCost, and Quantity. Press F11 to return to the Database Window.

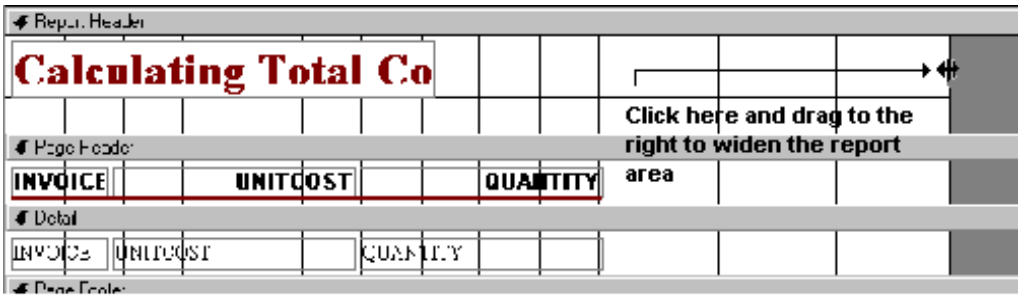
3. Click on the *Report* object and create a new report based on the HARDWARE table. Include the fields Invoice, UnitCost and Quantity. In the final wizard window, give your new report a name - *Calculating Total Cost*, and click Finish. Access will generate the report and display it in Print Preview mode.

4. Switch to report design view by clicking on the Close toolbar button.

Changing the Report Margins

5. Widen the working area of your report by extending the margins. To do this, move your mouse over to the right margin of the report area until the ⇹ symbol appears (refer Figure 5-24). Click and drag to the right to widen the report area. Release your mouse button, and Access will adjust the report width.

Figure 5-24



Creating Calculated Controls in Reports

6. A *calculated control* contains an expression and displays the results of that expression when a report is run. To practice creating a calculated control, let's multiply UnitCost by Quantity. Since this calculation will be a composite of two existing fields, we need to create an area to contain the calculation.

7. To do this, click once on the text box button ab in the *Toolbox*. Now click once in an empty area on the right hand side of the Detail section of the report (ie: next to the Quantity field). This action generates an unbound box. An unbound box is one not associated with any existing

field of the table upon which the report is based. Unbound boxes can be used for showing text, the results of calculations, or graphics.

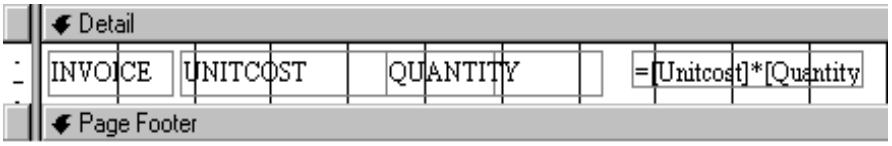
8. Click inside the unbound text box to get a blinking insertion point (the *I-beam*). Type: =Unitcost*Quantity and press the Enter key. Access will automatically add the syntax for you by enclosing each field in square brackets. Access is not case sensitive, so it does not matter whether you enter your field names in upper or lower case. You must however, spell them correctly !!

Note:
If field names contain spaces you must enclose them in square brackets
eg: [Time to Market]

Any expression in Access must commence with the = sign. The asterisk (*) sign 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 look similar to Figure 5-25. Click on the Print Preview toolbar button, and run your report.

Figure 5-25



10. Give your calculated contol a heading. Click on the label  button on the toolbox to create a label for displaying descriptive text, and then click in the Page Header section of the report, and position above the calculated control. Click to activate the I-beam, and then enter the heading TOTAL. Rerun your report to see the difference. Your report should look similar to Figure 5-26.

11. Send your report to print. Save your report (eg: *TCost*) by clicking on the Save toolbar button, or by selecting FILE/SAVE from the menu.

12. Press F11 to return to the database window.

Figure 5-26

Calculating Total Cost

INVOICE	UNITCOST	QUANTITY	TOTAL
1234	25	2	50
1235	15	1	15
1236	12.5	4	50

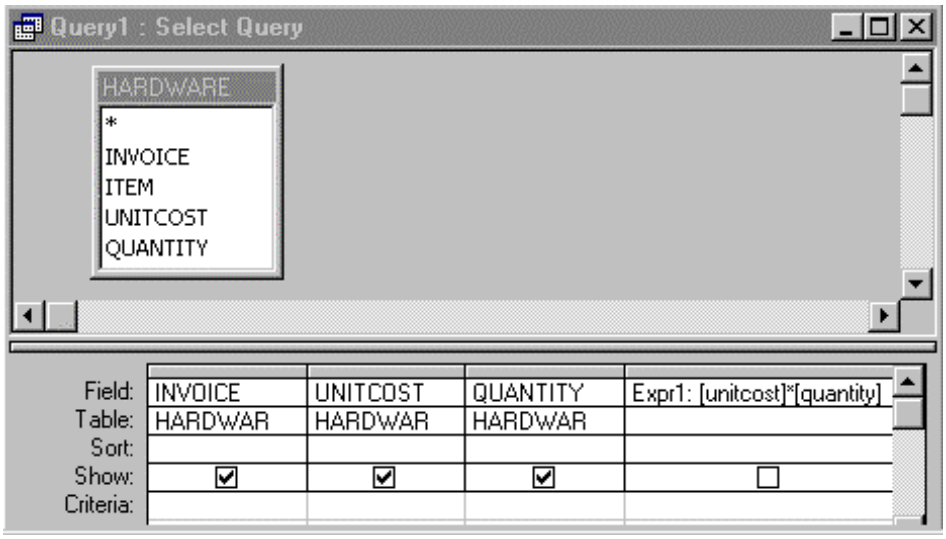
Calculations in Queries

A more rapid way of achieving the same result, is to use the Query window for creating your calculation, and then to use the query as the basis for a report.

1. From the HARDWARE database window, create a new query. From the HARDWARE field list, drag the 3 fields Invoice, UnitCost, and Quantity down into the field bar of the QBE grid.

2. Type the expression **: =[UnitCost]*[Quantity]** into the next blank field (to the right of the Quantity field), and press Enter. Your query window should now look similar to Figure 5-27.

Figure 5-27



3. Press the query run toolbar button to see the results of your query. Save the query, and then create a new report, using your new query as the basis for the report.

Expressions play many roles in Access, and can be used with 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. Expressions can also be used in *form and report design* windows to create calculated controls with the text box toolbox tool.

Operators and Functions in Access

Operators in an expression describe the type of action the expression should perform, or how a comparison between two values should be carried out. There are four types of operators in Access. 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 system using the term *operators*.

Arithmetic and Text	
^	raise one number to the power of another
*	multiply two numbers
/	divide two numbers
+	add two numbers
-	subtract two numbers, or negate a number
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 (eg: is Null)
Is Not	comparison is not True (eg: not Null)

A *function* in Access performs a calculation on data, and then returns the result of that calculation. There are over 100 functions available in Access, and there are eight different types. 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 system using the term *functions reference*.

Date/Time	
Date	returns current date
Now	returns current date and time
Logical	
IIF	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 first argument
Aggregate	
Avg	average

Count	count how many
Sum	sum total

The Access Form and Report Toolbox

	**Select Objects**	Use to select a control, section, or form. Click this tool to unlock a toolbox button that you've 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 a form's 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 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 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 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 the form's or 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, for example, to emphasize related or especially important information.
	**Rectangle**	Use for graphic effects such as grouping a set of related controls on a form, or 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.

Tutorial For Database Case 2 Using Access 2.0

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2. Let's add a new field to the end of the existing database. The name for the new field will be "Comments", and the data type will be Memo. Recap the tutorial for Case 1, if you are unsure how to add new fields and select data types. Notice that the Field Size bar in the properties box does not appear when you select a memo data type, indicating the unstructured nature of this field. Save your changes to the table structure by clicking on the *Save* toolbar button, or selecting FILE/SAVE from the menu.

3. Return to datasheet view by clicking on the datasheet toolbar button, or selecting VIEW/DATASHEET from the menu. Scroll or Tab over to the new Comments field, and enter text against each record (eg: whether the person in question is a Personal or Professional friend). Press the ↓ cursor key on your keyboard to move to the next record. Remember that as you move to a different record, Access will automatically save any changes.

Printing Memo Fields

Memo fields can be printed like any other field in a database. For a quick report including memo fields:

1: From datasheet view, press the F11 key to return to the Database window. Click the *Query object* and click *New*. From the New Query box, click on the *New Query* button, and Access will open up a new query window. From the Add Table box click and highlight the FRIENDS table, and then click *Add*, and then click *Close*.

2. From the FRIENDS *field list*, select and drag the LastName and Comments fields down onto the Field bar in the *QBE Grid* of the query window.

3. Click on the *Run* toolbar button or select QUERY/RUN from the menu to display the contents of the Last Name and Comments fields print (see Figure 5-28)

4. Click on the *Print* button or choose FILE/PRINT to send your query to. Select FILE/CLOSE from the menu and click *No* to the Save Query request to return to the Database Window without saving the query.

Figure 5-28

Select Query: Query1

LASTNAME	COMMENTS
Drucker	Professional
Whitney	Personal
Sitkin	Professional
Skalek	Professional
Salione	Personal
Fabian	Personal
Kohlman	Father-in-Law
Tedesco	Professional
Zito	Professional
Peterson	Personal
Nelson	Personal

Record: 1 of 11

Creating Reports in Access

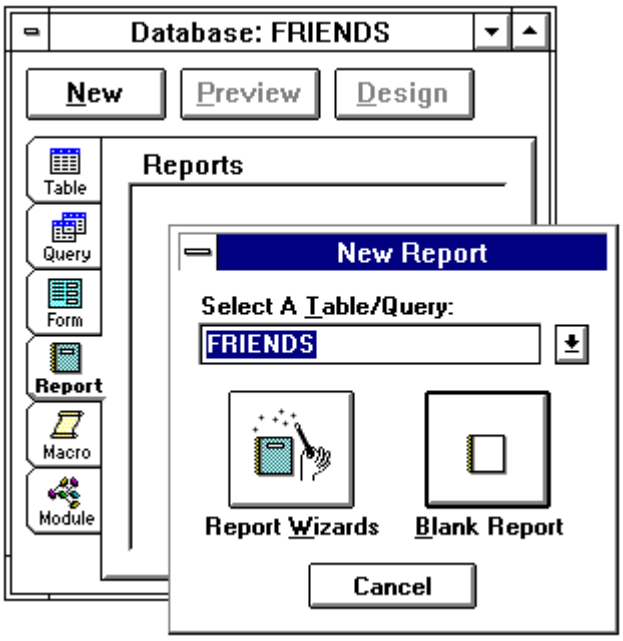
A polished look to your printouts can be achieved using the Access report function. Reports can be based on tables and/or queries, and are used to provide sub-totals and grand totals of numeric fields, and to produce summaries, mailing labels, and presentation quality display of your data. Report Wizards speed up the creation, display and printout of reports by providing a series of popular style templates to choose from.

The items on a report that display or print data are known as *controls*. With a control, you can display data from fields, calculation results, text for report headings, and include graphs, pictures and other Access objects.

1. From the +Database Window (press the F11 key if you are not in this position), click on the *Report object*, and then click *New*. From the New Reports box, click on the ↓ button to the

right of the *Select a Table/Query* Bar, and click and highlight on *FRIENDS* (see Figure 5-29). This action tells Access that the new report will be based on data contained in the FRIENDS table.

Figure 5-29



2. Click on the *Report Wizards* button. This generates the Report Wizards box (see Figure 5-30) and displays a list of six different report templates to choose from. By clicking on each one in turn , Access will provide you with a brief description of the type of report each template will produce. Click on *Tabular*, and then click *OK*.

3. This drops you into the first of four Wizard setup windows (see Figure 5-31). This first window enables you to choose the fields that will appear in the report, and to decide the order in which they will be displayed. Let's select four fields - Title, FirstName, LastName and City for inclusion in the report.

Click and highlight the Title field in the field list (refer Figure 5-31), and then click on the  button to lodge the field onto the report list. Repeat this action for the remaining three fields, until the *Field order on report box* looks like the one shown in Figure 15-17. (If you accidently lodge the wrong field in the report list, highlight the unwanted field, and then click on the  button to return it to the FRIENDS field list). When done, click the *Next* > button.

Figure 5-30

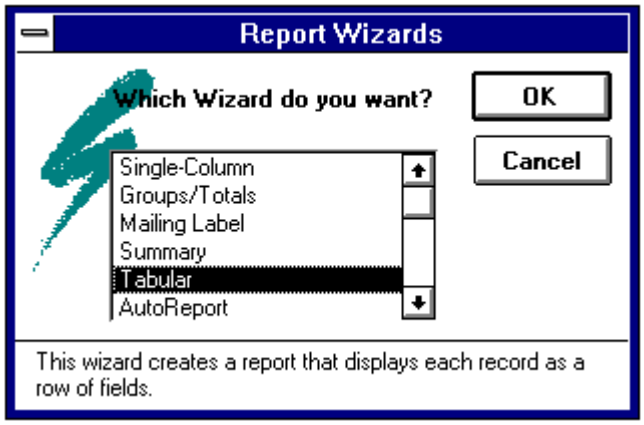
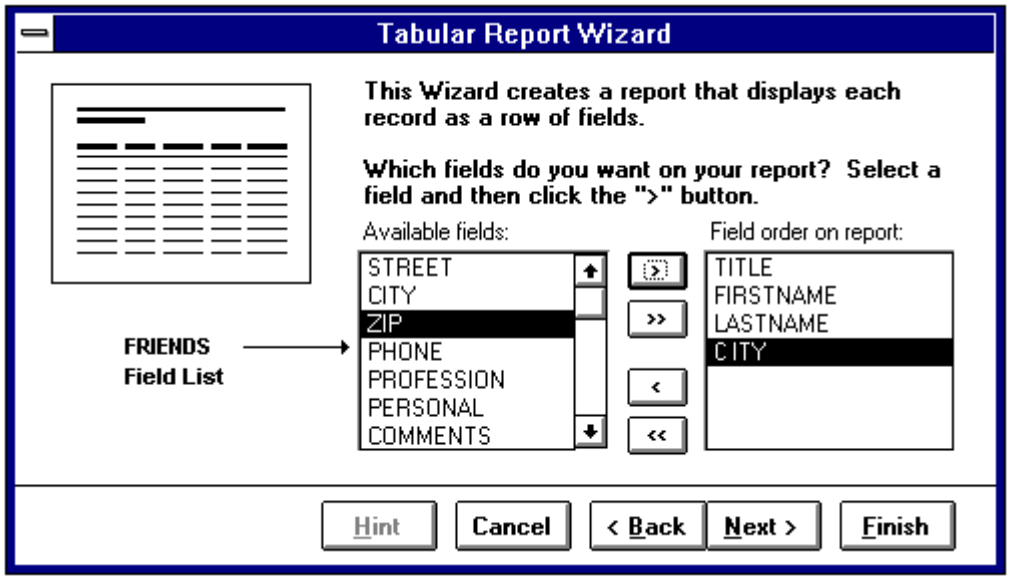


Figure 15-31



4. The second of the four report wizard windows is an optional action, and allows you to impose a sort order on the data in your report based on one or more fields. Click on City in the FRIENDS field list and then click on the  button to lodge this into the *Sort order of records* box. Click *Next* >.

5. The third wizard window allows you to determine how your report will look when printed out. Radio buttons offer a choice between Portrait and Landscape orientation, and Ledger, Presentation or Executive report styles. For the purposes of our simple report, accept the default by clicking on the *Next* > button.

6. The final report wizard window allows you to enter a customised title for your report. By default, Access enters in a title based on the name of the table or query from the the report is derived - in this case FRIENDS. Type in a new title: "Report of my Friends". Click in the box next *to See all the fields on one page* to force Access to confine field display to one page.

7. Click on the *Finish* button, and Access will proceed to generate the report, and display it in Print Preview mode. Note that the records are displayed alphabetically by City according to the sort order we imposed. Click on the *Print* toolbar button or select FILE/PRINT from the menu to send your report to print.

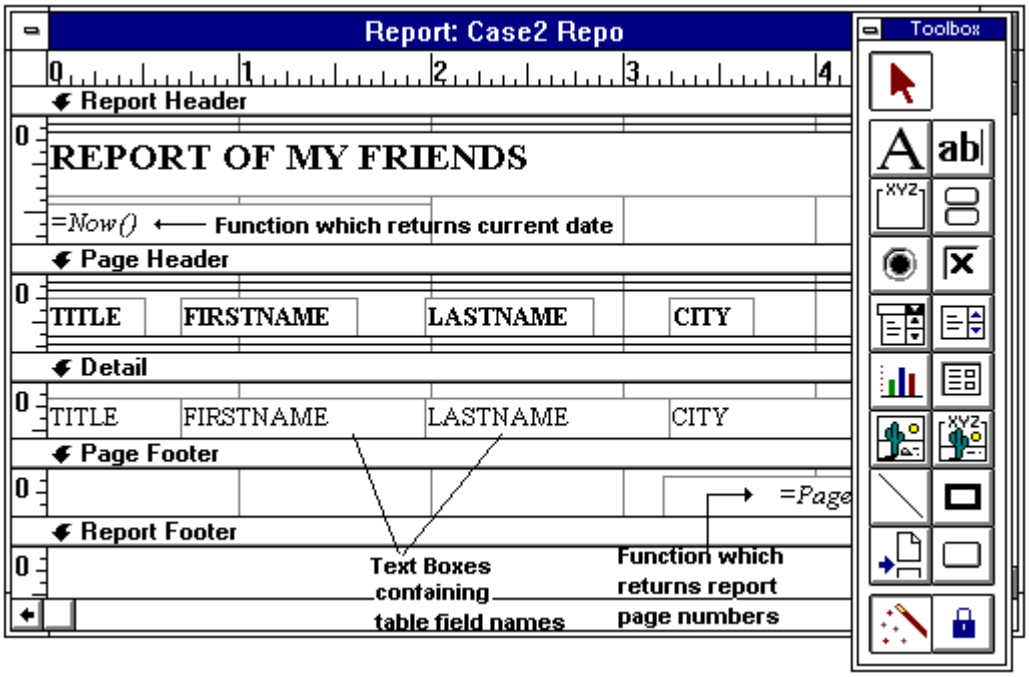
8. Save your report by clicking on the *Save* toolbar button or selecting FILE/SAVE from the menu. Type a name for your report (eg: *Tute2 Repo1*) in the Save As box and click *OK*. Press *F11* to return to the Database Window.

How to Use Reports to Display and Print Selected Fields.

Existing reports can be assigned to tables and/or queries other than the one they were originally based on. Let's say you wanted a report based on the results of the second query created in the tutorial for Case 1 (eg: *Tute1 Query2*). This query filtered out all records in the FRIENDS table that did not have the title of "Mr".

1. From the Database Window, click on the *Report object*, and click and highlight the report we have just created. Click on the *Design* button in the Database Window, and this will drop you into report design view (see Figure 5-32).

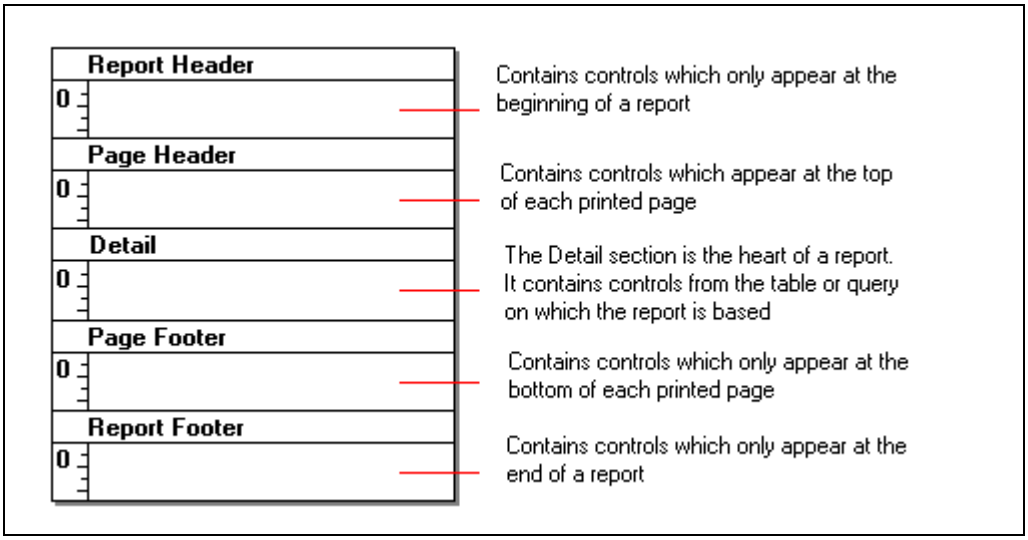
Figure 5-32



The design view comprises two main elements:

- a report design sheet divided into a number of sections. The purpose of each of these sections is briefly described in Figure 5-33
- a collection of control buttons known as a Toolbox. Descriptions for each of these buttons is provided at the end of this tutorial.

Figure 5-33



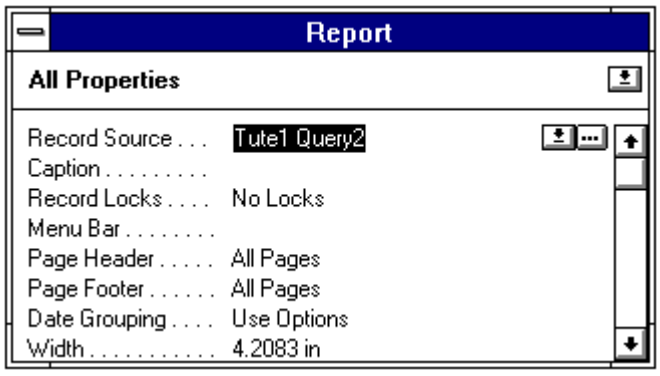
In addition to the above, sections can also be defined for headers and footers that are based around *groups* of records with like values. We will be looking at report groups in a later tutorial.

2. From the EDIT menu, choose SELECT REPORT and then click the *Properties* toolbar button, or choose VIEW/PROPERTIES from the menu. This activates the report properties sheet (see Figure 5-34). Report properties define the data source for a report as well as its overall appearance.

3. On the properties sheet, click the ▼ button to the right of the Record Source bar. This activates a drop down list of all tables and queries associated with the FRIENDS database. Click on the second query you created in the Case 1 tutorial to change the record source for the report.

4. Close the properties sheet by double clicking on the  box in the top left hand corner.

Figure 5-34



5. Click on the Print Preview toolbar button, or select FILE/PRINT PREVIEW from the menu. This shows a reduced data set as per the requirements of the query, with the sort order of the City field and presentation style imposed by the original report setup.

6. Click on the *Print* toolbar button to send your report to print.

7. Save your report by clicking on the *Save* toolbar button or selecting FILE/SAVE from the menu. Choose a name for your report (eg: *Tute2 Repo2*). Press *F11* to return to the Database Window.

Using Expressions in Reports

Expression*s* are used to get information that cannot be directly obtained from the tables in a database. An *expression* is a calculation that results in a single value. Expressions are comprised of a combination of operators (such as + and =), constant values, field names and functions. For example the expression, =[UnitCost]*[Quantity] multiplies the contents of two fields, named UnitCost and Quantity, and then displays a single value result. A *function* is a procedure or routine that returns a value. For example, the *=Now()* function shown in the Report Header section of Figure 5-18, returns the current date as stored in your computer's system clock.

Access offers three ways of entering expressions in reports:

- by typing an expression in a field text box (see Figure 5-32)
- by using any control (graphical object) that has a Control Source property; or
- by using the Access Expression Builder.

To learn and practice the skill of entering expressions, we will use the first of these three methods, and the sample database HARDWARE.MDB provided on your *Solve It!* disk.

1. Load HARDWARE.MDB. *(Warning: If you still have tables or reports open from the FRIENDS database, you should save them and close them before opening the HARDWARE database).*

2. From the *Table* object, double click to open the HARDWARE table and examine the record contents. There are four fields: Invoice, Item, UnitCost, and Quantity. Press F11 to return to the Database Window.

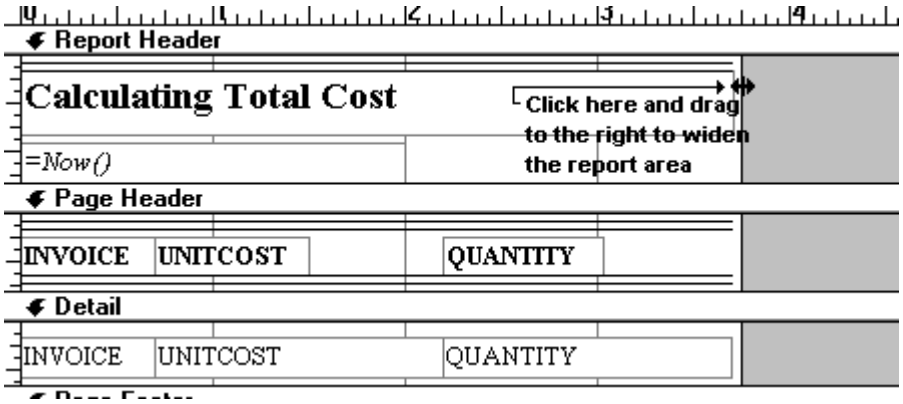
3. Click on the *Report* object and create a new report based on the HARDWARE table. Include the fields Invoice, UnitCost and Quantity. In the final wizard window, give your new report a name - *Calculating Total Cost*, and click Finish. Access will generate the report and display it in Print Preview mode.

4. Switch to report design view by clicking on the Close Window  toolbar button.

Changing the Report Margins

5. Widen the working area of your report by extending the margins. To do this, move your mouse over to the right margin of the report area until the ⇹ symbol appears (refer Figure 5-35). Click and drag to the right to widen the report area. Release your mouse button, and Access will adjust the report width.

Figure 5-35



Creating Calculated Controls in Reports

6. A *calculated control* contains an expression and displays the results of that expression when a report is run. To practice creating a calculated control, let's multiply UnitCost by Quantity. Since this calculation will be a composite of two existing fields, we need to create an area to contain the calculation.

7. To do this, click once on the text box button ab in the *Toolbox*. Now click once in an empty area on the right hand side of the Detail section of the report (ie: next to the Quantity field). This action generates an unbound box. An unbound box is one not associated with any existing field of the table upon which the report is based. Unbound boxes can be used for showing text, the results of calculations, or graphics.

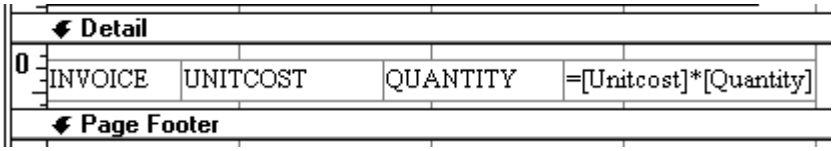
8. Click inside the unbound text box to get a blinking insertion point (*I-beam*).
Type: =Unitcost*Quantity and press the Enter key. Access will automatically add the syntax for you by enclosing each field in square brackets. Access is not case sensitive, so it does not matter whether you enter your field names in upper or lower case. You must however, spell them correctly !!

Note: If field names contain spaces you must enclose them in square brackets eg: [Time to Market]

Any expresssion in Access must commence with the = sign. The asterisk (*) sign 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 look similar to Figure 5-36. Click on the Print Preview toolbar button, and run your report.

Figure 5-36



10. Give your calculated contol a heading. Click on the label  button on the toolbox to create a label for displaying descriptive text, and then click in the Page Header section of the report, and position above the calculated control. Click to activate the I-beam, and then enter the heading TOTAL. Rerun your report to see the difference. Your report should look similar to Figure 5-37.

Figure 5-37

Calculating Total Cost

01-Feb-95

INVOICE	UNITCOST	QUANTITY	TOTAL
1234	25	2	50
1235	15	1	15
1236	12.5	4	50

11. Send your report to print. Save your report (eg: *TCost*) by clicking on the Save toolbar button, or by selecting FILE/SAVE from the menu.

12. Press F11 to return to the database window.

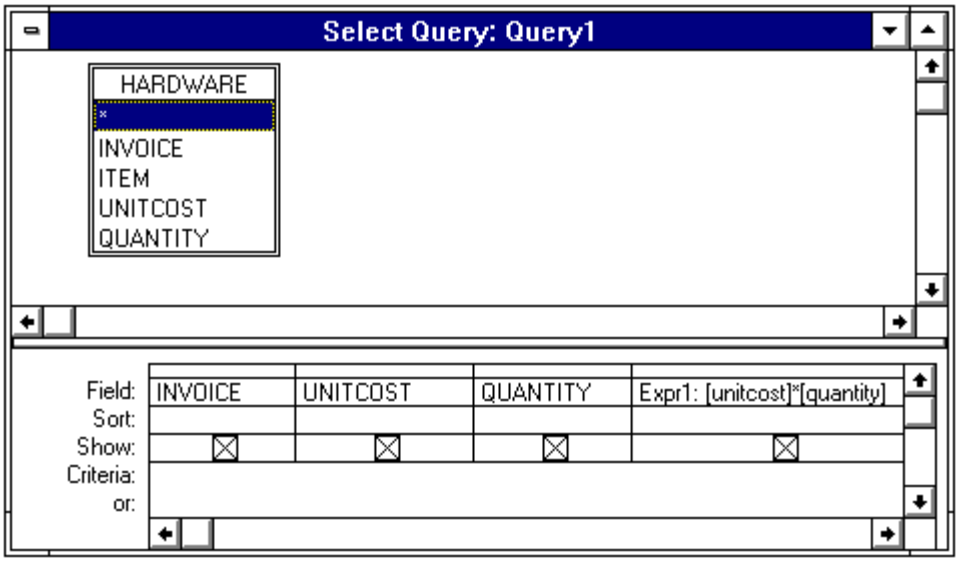
Calculations in Queries

A more rapid way of achieving the same result, is to use the Query window for creating your calculation, and then to use the query as the basis for a report.

1. From the HARDWARE database window, create a new query. From the HARDWARE field list, drag the three fields Invoice, UnitCost, and Quantity down into the field bar of the QBE grid.

2. Type the expression: =[UnitCost]*[Quantity] into the next blank field (to the right of the Quantity field), and press the Enter key. Your query window should now look similar to Figure 5-38.

Figure 5-38



3. Press the query run toolbar button to see the results of your query. Save the query, and then create a new report, using your new query as the basis for the report.

Expressions play many roles in Access, and can be used with 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. Expressions can also be used in *form and report design* windows to create calculated controls with the text box toolbox tool.

Operators in an expression describe the type of action the expression should perform, or how a comparison between two values should be carried out. There are four types of operators in Access. The table below lists only those likely to be used in *Solve it!*. For a more complete list, consult the Access Cue Cards, or search the Help system using the term *operators*.

Arithemetic and Text	
^	raise one number to the power of another
*	multiply two numbers
/	divide two numbers
+	add two numbers
-	subtract two numbers, or negate a number
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 (eg: is Null)
Is Not	comparison is not True (eg: not Null)

A *function* in Access performs a calculation on data, and then returns the result of that calculation. There are over 100 functions available in Access, and there are eight different types. The table below lists only those likely to be used in *Solve it!*. For a more complete list, consult the Access Cue Cards, or search the Help system using the term *functions: reference*.

Date/Time	
Date	returns current date
Now	returns current date and time
Logical	
IIF	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 first argument
Aggregate	
Avg	average
Count	count how many
Sum	sum total