

Access 2010: Part II

Tables and Queries

Stephen Moffat, The Mouse Training Company

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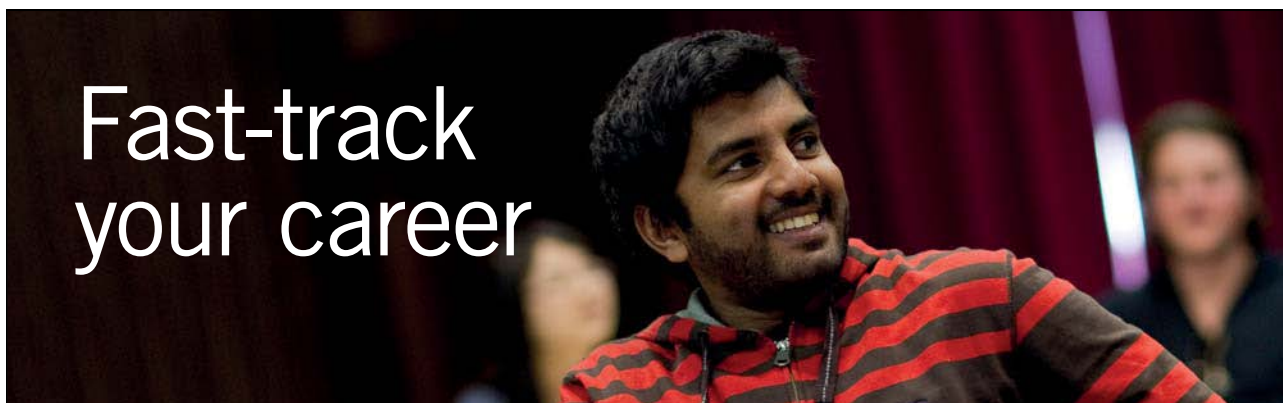
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Section 4 Tables

BY THE END OF THIS SECTION YOU WILL BE ABLE TO

- Build tables
- Set field properties
- Set primary key
- Create lookup fields
- Relate tables
- Manage data within tables
- Format and set defaults for tables

Creating Tables

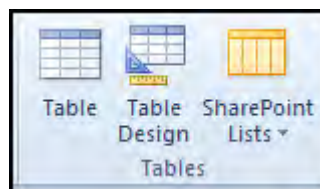
In this lesson we will learn much more about the usage of tables, including how to build them from scratch. You now should be familiar with the views and the terminology within access. We should have our database all planned out.

About Tables

You should be very familiar with the components of tables by now. We know a table is made up of several records each containing fields with data. Access also makes it easy to build and modify any component of a table using Design view, which we will cover later in this manual.

When designing a database, it is critical that you take the time to design your database carefully. Although it is not a difficult job to make some adjustments to a field, adding or removing fields in a large established database can be a real headache. It is important to communicate with everyone who will be using the database to make sure that everyone has the information they will need. Don't be afraid to build a database a little bigger than you think it needs to be; if you end up with unused fields they are much easier to take out than to put new fields in.

Create An Empty Table



Access gives you the ability to create a table in a few different ways: opening an empty table and inputting values, using a template, or using Design view to construct your table by hand.

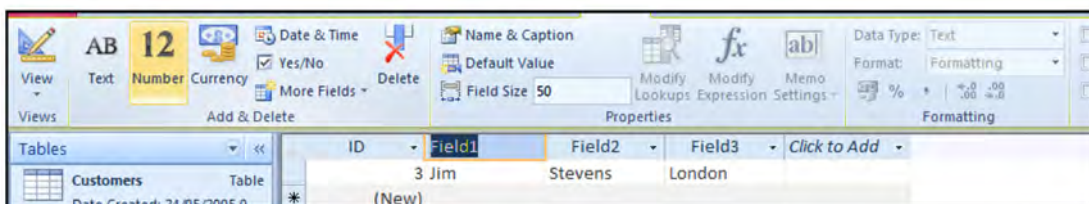
Use the **TABLES** section of the **CREATE** ribbon to make a table:

► To create an empty table

MOUSE



1. Click the **TABLE** command to open a new empty table. A new tab will open, containing an empty table in **DATASHEET** view:
2. Click inside the **ADD NEW FIELD** column and start entering data.
3. Press **ENTER** or **TAB** to keep adding fields to the record, or click in the “new” row to make a new record. Once all fields are entered for the first record **TAB** and **ENTER** will move you through the record and then onto a new record. Not creating any more fields unless you click in the addnew field column



4. At the Top of the column where it says field1, field2 etc, double click to enter a field name and press return to enter that name.
5. In the **ADD & DELETE** group on the fields ribbon (table tools) select the format of a field whether a specific field is to hold textual or numerical data etc.
6. When you have entered some field names and data types click on **SAVE** to save the table a dialogue will appear.
7. Enter a name for your table and click **OK**

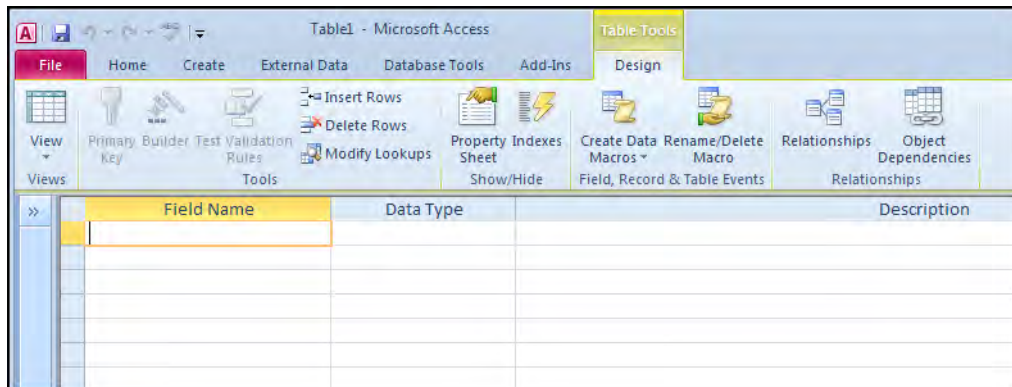
Create A Table In Design View

Creating a table in design view needs the most understanding of the construction of a table and access does the least to help you, but this is the opportunity if you have enough knowledge to create a table and set options that gives you the most flexibility in constructing your table exactly how you want it.

► To create in design view

MOUSE

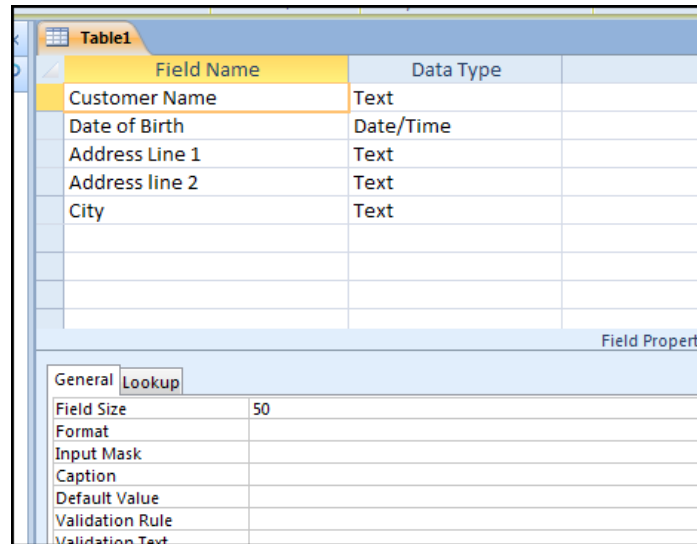
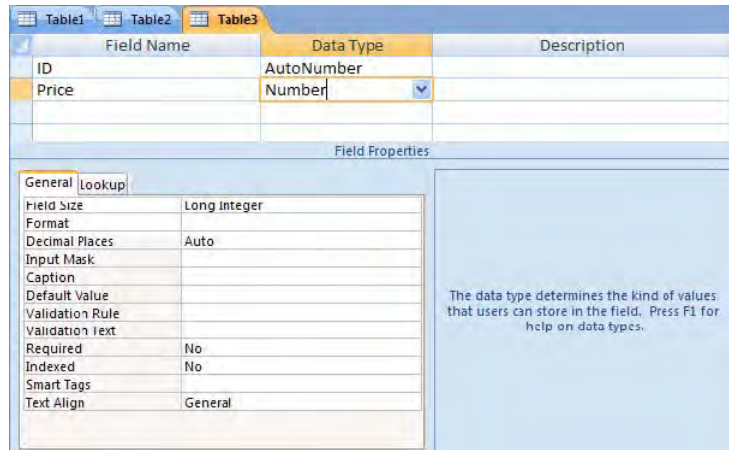
1. Click the **TABLE DESIGN** command on the **CREATE** ribbon to open a new blank table in design view. A new section of Access we have yet to explore will appear:
2. **DESIGN VIEW** includes its own **DESIGN** ribbon in a contextual tab. You have the ability to add a primary key, construct custom formulas, insert or delete different fields, and more.
3. Using **DESIGN VIEW** is more in-depth than simply entering data into fields. You can specify the field name, its data type, and give the field some sort of description if you like.



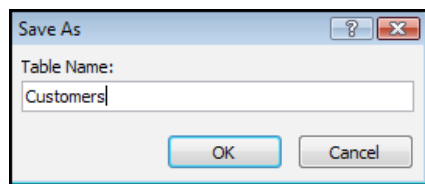
4. At the bottom of **DESIGN VIEW** is the **FIELD PROPERTIES** section. Here you can modify all of the properties of a particular field.

E.G. if you want to have a Price field in your database:

5. Give the field a **FIELD NAME**.
6. Choose a **DATA TYPE** for the field.
 - A data type can be a word, number, currency, date, time, etc.
 - The properties of the Price field (once defined as a number) include how large a price it can be, the number of decimal places, if the field should contain a default value (like \$5.99), and more. As we use tables more we will explore more of the details regarding Field Properties.



- When you have entered some field names and data types click on **SAVE** to save the table a dialogue will appear.



- Enter a name for your table and click **OK**
- Change the view to datasheet view and you are ready to enter records.

| Customers | | | | |
|---------------|---------------|----------------|----------------|------|
| Customer Name | Date of Birth | Address Line 1 | Address line 2 | City |
| * | | | | |

Adding Field Descriptions

The **FIELD DESCRIPTION** fields are located on the right side of Table Design view. The fields are optional, though they are useful when several people are involved in constructing a database. You can leave a note explaining a field's function or why a certain field exists. Anything written here is also displayed in the **Status Bar** of a form (we will explore forms later in this manual):

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| Vehicles | | |
|------------------|------------|------------------------------------|
| Field Name | Data Type | Description |
| Vehicle ID | AutoNumber | Primary key of this table. |
| Make | Text | Manufacturer of this vehicle. |
| Model | Text | Model name/number of this vehicle. |
| Manufacture Date | Number | First year of production. |
| Engine Type | Text | Engine type of the vehicle. |

You can type whatever you like in a field description, just as long as the description is less than 255 characters.

Setting Data Types

Setting a Data Type for a field is a very important first step in creating your database to holding the data you want in the correct format. Think of each field as a box holding a very specific type of thing not all of your data will be textual. It may be numerical it may be dates, it may even be a picture or a file. Setting a Data Type helps to ensure that the data entered follows certain rules

For example

Numbers can be calculated with adding, subtracting etc like in excel. Text can be joined together (text strings) yes/no to be able to use check boxes etc.

When you were planning your database thought should have been given to what type of data would be held in which field. After the initial creation of a table and setting your field descriptions we must now ensure the Data Types are set correctly.

► To set a Data Type

MOUSE

| Customers | |
|----------------|------------------|
| Field Name | Data Type |
| Customer ID | AutoNumber |
| Customer Name | Text |
| Date of Birth | Memo |
| Address Line 1 | Number |
| Address line 2 | Date/Time |
| City | Currency |
| | AutoNumber |
| | Yes/No |
| | OLE Object |
| | Hyperlink |
| | Attachment |
| | Calculated |
| | Lookup Wizard... |

1. Create or open a table in design view
2. Select a field in the topmost part of the design window
3. Use the combo box in the Data Type column to choose a Data Type for the respective field.
4. When all Data Types have been selected save the table return to datasheet view to enter data.

Rename A Field

When you add a field by entering data in Datasheet view, Access automatically assigns a generic name to the field. Access assigns the name Field1 to the first new field, Field2 to the second new field, and so on. By default, a field's name is used as its label wherever the field is displayed, such as a column heading on a datasheet. Renaming fields so that they have more descriptive names helps make them easier to use when you view or edit records.

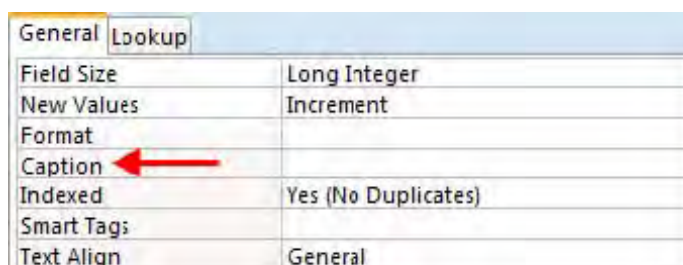
► To rename a field

MOUSE

1. Right-click the heading of the field that you want to rename (for example, Field1).
2. On the shortcut menu, click **Rename Column**.
3. Enter the new name in the field heading.
 - *Field names can consist of up to 64 characters (letters or numbers), including spaces.*

Adding Captions

The Caption field property is available to every data type available to Access. You can specify a caption to be a customized label for a field when the field is used in a form or report. You can name a caption whatever you like, or leave the field name as the default caption name.



► To add a caption

MOUSE

1. Open or create table in design view
2. Enter a field name that will be used in the database.
3. In the **PROPERTIES** section in the **CAPTION** box enter a more user friendly name that users will understand more readily as a field heading

- *Convention and practicality show that field names are best kept short, to the point and preferably have no spaces (this helps in calculations) capitalisation of each word in the field name makes for easier remembering and reading, The caption is only a label and can be whatever you wish it is what the users will see.*

E.G. A last name field would be written LastName but the caption could read “Last name” or “Customer surname” as long as the users would understand

Inserting, Deleting, And Moving Fields

Let’s continue with our vehicle database example. Access lets you easily insert new fields, delete useless/unused fields or fields that are not relevant to the data, and move the order of fields in a table. The easiest way to perform these tasks is by using the table Design view.

In this example, we will add two more rows to the vehicle table: Engine type and Colour.

► To insert a new field.

EITHER



1. Click in the empty cell beneath the last row in Design view and enter the data

OR

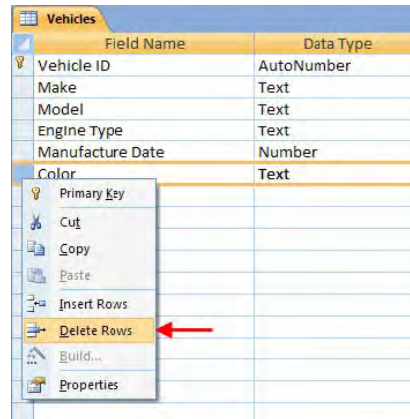
1. insert a row between two existing rows. by right-clicking the **MANUFACTURE DATE** field and choose **INSERT ROWS:**
2. This will create a new row between Model and Manufacture Date:

| Vehides | |
|------------------|------------|
| Field Name | Data Type |
| Vehicle ID | AutoNumber |
| Make | Text |
| Model | Text |
| | |
| Manufacture Date | Number |

3. Type **ENGINE TYPE** for the field name and **TEXT** as the Data Type.
4. To insert the Colour field beneath Manufacture Date, simply click in the next empty cell in the **FIELD NAME** column and type **COLOUR** as the name; and **TEXT** as the data type:

► To delete a row,

First make sure that you remove any dependencies or relationships that may exist with other database objects. Access can help you with this task, but to be on the safe side, you should first make a backup copy of the database or the table by using the **SAVE AS** command.



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1. Right-click on the blue box beside the field name and click **DELETE ROWS**

► **To move a field,**

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1. Click the blue box beside the field you want to move to highlight the row.
2. Click the field again, hold down the left mouse button and then drag the field up or down through the rows of Design view.

| Field Name | Data Type |
|------------------|------------|
| Vehicle ID | AutoNumber |
| Make | Text |
| Model | Text |
| Engine Type | Text |
| Manufacture Date | Number |

3. You will see a bold black line between the various fields as you move:
4. When the black line is in the location you want to move the row, release the mouse button.

Selecting Data

You can select any or all adjacent fields/columns/records in a table at once.

► **To select an entire table of data,**

MOUSE

1. Open a table in Datasheet view and press **CTRL + A** on your keyboard.

OR,

1. Click the Table Selector button (located in the upper left-hand corner of Datasheet view) to perform the same action:

| EmployeeID |
|------------|
| 1 |
| 2 |

- To select two or more adjacent records,
MOUSE

The top screenshot shows the 'Employees' table with columns 'EmployeeID' and 'SIN'. The first record (EmployeeID: 1, SIN: 123456789) is selected, indicated by a red arrow pointing to the selection box on the left.

The bottom screenshot shows the same table with three records selected (EmployeeID: 1, 2, and 4). A red double-headed arrow indicates the range of selection from the first to the fourth record.

1. Click the box to the immediate left of a record to highlight it:
2. Press and hold the **SHIFT** key on your keyboard and click the box beside another record in the table. All records in between will be selected, including the record you clicked:
3. To select two or more adjacent columns, move your mouse over a column header. Your cursor will become a small down arrow; click and hold the left mouse button and drag left or right to highlight as many columns as you want:

The screenshot shows a table with columns: First Name, Last Name, Title, and Phone. A red double-headed arrow is drawn across the headers of the first three columns, indicating they are selected.

4. Finally, you can also select any range of adjacent cells inside a column of data. For example, if we want to highlight all the fields from the Product ID of Northwind Traders Chai to the Standard Cost of Northwind Traders Beer:

| Product Code | Product Name | Description | Standard Cost |
|--------------|--|-------------|---------------|
| NWTB-1 | Northwind Traders Chai | | \$13.50 |
| NWTCO-3 | Northwind Traders Syrup | | \$7.50 |
| NWTCO-4 | Northwind Traders Cajun Seasoning | | \$16.50 |
| NWTO-5 | Northwind Traders Olive Oil | | \$16.01 |
| NWTJP-6 | Northwind Traders Boysenberry Spread | | \$18.75 |
| NWTDFN-7 | Northwind Traders Dried Pears | | \$22.50 |
| NWTS-8 | Northwind Traders Curry Sauce | | \$30.00 |
| NWTDFN-14 | Northwind Traders Walnuts | | \$17.44 |
| NWTCFV-17 | Northwind Traders Fruit Cocktail | | \$29.25 |
| NWTBGM-19 | Northwind Traders Chocolate Biscuits Mix | | \$6.90 |
| NWTJP-6 | Northwind Traders Marmalade | | \$60.75 |
| NWTBGM-21 | Northwind Traders Scones | | \$7.50 |
| NWTB-34 | Northwind Traders Beer | | \$10.50 |

- First, click inside the field for the Chai Product Code, as shown above. Move your mouse to the bottom or right border of the highlighted field; your mouse cursor will turn into a thick cross. Then, click and drag from the highlighted field to the last field you want to select:

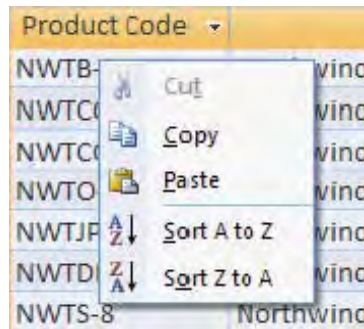
| ID | Product Code | Product Name | Description | Standard Cost | List Price |
|----|--------------|--|-------------|---------------|------------|
| 1 | NWTB-1 | Northwind Traders Chai | | \$13.50 | \$18.00 |
| 3 | NWTCO-3 | Northwind Traders Syrup | | \$7.50 | \$10.00 |
| 4 | NWTCO-4 | Northwind Traders Cajun Seasoning | | \$16.50 | \$22.00 |
| 5 | NWTO-5 | Northwind Traders Olive Oil | | \$16.01 | \$21.35 |
| 6 | NWTJP-6 | Northwind Traders Boysenberry Spread | | \$18.75 | \$25.00 |
| 7 | NWTDFN-7 | Northwind Traders Dried Pears | | \$22.50 | \$30.00 |
| 8 | NWTS-8 | Northwind Traders Curry Sauce | | \$30.00 | \$40.00 |
| 14 | NWTDFN-14 | Northwind Traders Walnuts | | \$17.44 | \$23.25 |
| 17 | NWTCFV-17 | Northwind Traders Fruit Cocktail | | \$29.25 | \$39.00 |
| 19 | NWTBGM-19 | Northwind Traders Chocolate Biscuits Mix | | \$6.90 | \$9.20 |
| 20 | NWTJP-6 | Northwind Traders Marmalade | | \$60.75 | \$81.00 |
| 21 | NWTBGM-21 | Northwind Traders Scones | | \$7.50 | \$10.00 |
| 34 | NWTB-34 | Northwind Traders Beer | | \$10.50 | \$14.00 |

Cutting, Copying, And Pasting Data

Once you have selected the data you want, you can easily copy data for use elsewhere and paste data into the table.

► To copy highlighted data from a table,

MOUSE



1. Right-click the data you have selected
2. Click **COPY**:

This saves a copy of the highlighted data in the clipboard of your PC. Once data has been copied, it can be used in a word processor, a spreadsheet, or some other program that uses text and numerical data.

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► To paste the data in the clipboard to another program

1. you can click **PASTE** from the clipboard group on the home ribbon

OR

2. **EDIT - PASTE**- using the menu of the other program.

OR

3. Most programs also feature some sort of right-click functionality; right-click your mouse where you want to the data to go and
4. Click Paste.
5. To paste data into a table is a bit more complicated. You will need to make sure that your source data does not have the same primary key as any record currently in your table. If you do, Access will prompt you with an error saying that a duplicate primary key has been detected in the table. You must assign a new primary key to the pasted record(s) in order to continue. To perform the paste operation, copy the data from the source program and paste it into the Datasheet view of a table by right-clicking inside the upper-leftmost cell you want to place the data Paste.

Cutting data in Access requires care if the table you are cutting the data from is related to many other tables in the database. Cutting data from a table has the same effect as deleting data; that is, it no longer exists in the source table. Therefore, if there are other tables in the database that rely on the information you are potentially removing, you will need to remove the relationship between the two tables first. Cutting data has the same sort of effect as copying data; it is stored on the clipboard of your PC until you paste it into another program.

Primary Key

If you are worked with Access in earlier versions, chances are you have been using the Table Wizard to help construct tables. One of the nice things about the Wizard is that it can automatically define a primary key for you. The Wizard is great for getting going, but once you become more comfortable with databases in general, you will likely build all of your tables using Design view. There is no table wizard in 2010.

A primary Key is a very important Part of a table it allows you to uniquely identify a specific record with an alphanumeric string (mixture of letters and numbers) that cannot be repeated within that table this can in turn be used within your database to refer to that record of data without repeating all the field information within that record.

Think of it like this we give a customer a Unique identifier (primary key value) of say BX21 this refers to a specific person. The rest of the fields in the table would hold that customers information: address, fullname, tel no Age etc. Instead of repeating this information again later on when utilising customer information we only need refer to the unique identifier value for the database to pull up and use the rest of the information.

We will look at this more later on as the importance of the Primary key is of the highest level. We look now at just having the ability to create one within our table.

Create A Primary Key In A New Table

In previous versions of Access,(2000 – 2003) a primary key was not automatically defined when creating a table in Design view. This was altered in 2007 where a key was automatically generated when creating a table in design view. When constructing a table in Design view using Access 2010, this is much the same as in in 2000 - 2003: You are now prompted when you are ready to close and save the table if a key has not been created manually by yourself

► To create key in new table

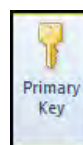
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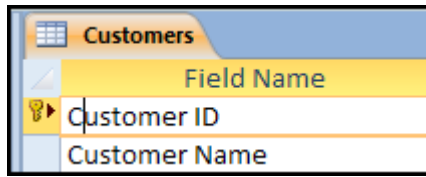
1. Create a table in design view as previously explained
2. Enter a field name and add the text “ID” to easily identify the field.

| Field Name | Data Type |
|----------------|------------|
| Customer ID | AutoNumber |
| Customer Name | Text |
| Date of Birth | Date/Time |
| Address Line 1 | Text |
| Address line 2 | Text |
| City | Text |

| General | |
|------------|---------------------|
| Field Size | Long Integer |
| New Values | Increment |
| Format | |
| Caption | |
| Indexed | Yes (Duplicates OK) |
| Smart Tags | |
| Text Align | General |

3. For ease at this point set the Data Type to autonumber (this will automatically add numbers to records in a sequence and not repeat any).
4. Ensure you are in the field you wish to use as the ID field and click on the **PRIMARY KEY** button on the **DESIGN** ribbon. In the **TOOLS** group.





5. A small key icon should appear next to the field name.
6. Also in the **PROPERTIES** section below where it says **INDEXED** it should now read to the right of that **“YES, NO DUPLICATES”**

Add A Primary Key To An Existing Table

► To add a new field and set it as the primary key

MOUSE

| General | | Lookup |
|------------|---------------------|--------|
| Field Size | Long Integer | |
| New Values | Increment | |
| Format | | |
| Caption | | |
| Indexed | Yes (No Duplicates) | |
| Smart Tags | | |
| Text Align | General | |

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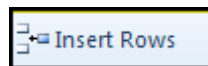
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1. However, consider the following table which does not contain a primary key:

| Customers | |
|----------------|-----------|
| Field Name | Data Type |
| Customer Name | Text |
| Date of Birth | Date/Time |
| Address Line 1 | Text |
| Address line 2 | Text |
| City | Text |

2. Currently this table does not have a primary key. If you recall, a primary key is used as some sort of unique identifier that separates every row in the table from every other. We need to enter a new field name it and set it as primary key
3. click within the first row (customer name)
4. On the ribbon in the **TOOLS** group click on the **INSERT ROWS** button



5. In the row that appears give it a name and set the Data Type to autonumber

| Customers | |
|----------------|------------|
| Field Name | Data Type |
| Customer ID | AutoNumber |
| Customer Name | Text |
| Date of Birth | Date/Time |
| Address Line 1 | Text |
| Address line 2 | Text |
| City | Text |

| General | |
|------------|---------------------|
| Field Size | Long Integer |
| New Values | Increment |
| Format | |
| Caption | |
| Indexed | Yes (No Duplicates) |
| Smart Tags | |
| Text Align | General |

6. Ensure you are in the field you wish to use as the ID field and click on the **PRIMARY KEY** button on the **DESIGN** ribbon. In the **TOOLS** group.
7. Primary keys in tables are denoted by a small key in the blue box beside the cell name:

Format Data and appearance (Design View)

Please see the table for the available Data Types and there sizes a database can hold a maximum of 2 gigabytes of data.

| Data type | Use to store | Size |
|------------|---|---|
| Text | Alphanumeric characters | Up to 255 characters. |
| | Use for text, or for numbers that are not used in calculations (for example, a product ID). A numeric value that is stored as text can be sorted and filtered more logically, but cannot be easily used in calculations. | |
| Memo | Alphanumeric characters (longer than 255 characters in length) or text that uses rich text formatting. | Up to 1 gigabyte of characters, or 2 gigabytes of storage (2 bytes per character), of which you can display 65,535 characters in a control. |
| | Use for text that is more than 255 characters in length, or for text that uses rich text formatting. Notes, lengthy descriptions, and paragraphs that use text formatting, such as bold or italics, are good examples of where to use a Memo field. | |
| Number | Numeric values (integers or fractional values). | 1, 2, 4, or 8 bytes, or 16 bytes when used for a replication ID. |
| | Use for storing numbers that are used in calculations, except for monetary values (use the Currency data type for monetary values). | |
| Date/Time | Dates and times. | 8 bytes. |
| | Use for storing date/time values. Note that each value stored includes both a date component and a time component. | |
| Currency | Monetary values. | 8 bytes. |
| | Use for storing monetary values (currency). | |
| AutoNumber | A unique numeric value that Access automatically inserts when a record is added. | 4 bytes or 16 bytes when used for replication ID. |
| | Use for generating unique values that can be used as a primary key. Note that values for AutoNumber fields can be incremented sequentially or by a specified value, or assigned randomly. | |
| Yes/No | Boolean values (yes/no). | 1 bit (8 bits = 1 byte). |
| | You can use one of three formats: Yes/No, True/False, or On/Off. | |

| | | |
|---------------|---|--|
| OLE Object | OLE objects or other binary data. Use for storing OLE objects from other Microsoft Windows programs. | Up to 1 gigabyte. |
| Attachment | Pictures, Images, Binary files, Office files. This is the preferred data type for storing digital images and any type of binary file. | For compressed attachments, 2 gigabytes. For uncompressed attachments, approximately 700kb, depending on the degree to which the attachment can be compressed. |
| Hyperlink | Hyperlinks. Use for storing hyperlinks to provide single-click access to Web pages through a URL (Uniform Resource Locator) or files through a name in UNC (universal naming convention) format. You can also link to Access objects stored in a database. | Up to 1 gigabyte of characters, or 2 gigabytes of storage (2 bytes per character), of which you can display 65,535 characters in a control. |
| Lookup Wizard | Not actually a data type; instead, this starts the Lookup Wizard. Use to start the Lookup Wizard so that you can create a field that uses a combo box to look up a value in another table, query, or list of values. | Table or query based: The size of the bound column. Value based: The size of the Text field used to store the value. |

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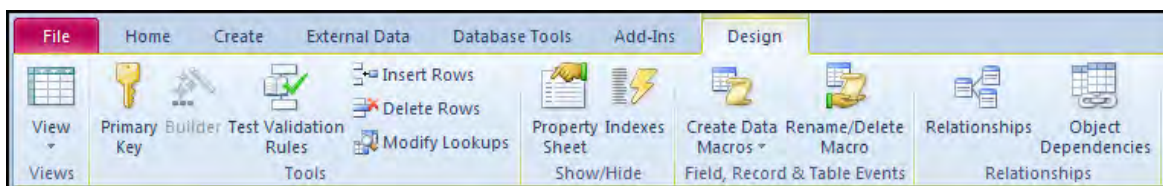
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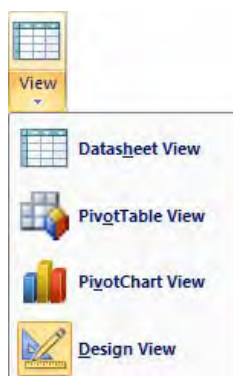
Design View Ribbon Features

Access 2010 features a special contextual tab that deals with Table Design:



Views

This command switches back and forth between the different views of a table:



Primary Key

This command toggles the primary key property for a field on and off. Although relatively rare, it is possible for a table to have more than one primary key.

Builder

Use this command to activate the expression builder. The expression builder is used to create logical expressions used to help ensure data is properly entered into a table. We will explore the use of this command in this lesson.

Test Validation Rules

This command will check any logical expressions built with the expression builder as well as other properties of a table to ensure there are no inconsistencies.

Insert Row

Use this command to insert a new field above the currently selected row in Design view.

Delete Rows

This will remove the currently selected field from Design view.

Modify Lookup

A lookup column is a special type of combo box used to enter data into a table. You can fill the lookup column with your own data, or use data from another table. Lookup columns are very useful in using information contained in a different table. We will explore lookup columns in this lesson.

Property Sheet

In addition to having field properties, each field has another set of properties you can modify that deal with more advanced properties. Though some are duplicates of the field properties, most of these properties are beyond the scope of this manual.

Indexes

This command is used to modify the background properties of an index you can apply to a field.

Relationships

We will look at this later in great depth as it is the core of a relational database

Field record & table events

Allows the viewing and setting of those macros within a table covered later in the manual.

Text Fields

Entering the field name and setting the Data Type are very important and for each field entered this should have been thought out beforehand. Setting say the customer name field to a text Data Type is one thing or setting the date of birth to date/time is another. But there are various data formatting options in the properties section of the field. That change the appearance of the data when you return to datasheet view.

There are two types of text fields in Access: Text and Memo. Open a table in Design view to adjust its field properties.

Text

The Text data type is probably the most overall used data type in a database. Its properties are similar in nature to the Number data type, meaning it can have an input mask, validation rules, and a default value. The IME Sentence Mode, IME Mode, and Unicode Compression all deal with translation properties when converting a database in one language to another, like from Japanese to English. Text fields can contain essentially every letter, character, and number. Text fields can also be set for a certain number of characters; 255 characters is the maximum size. Text fields in Access 2010 feature a new property, the ability to align text inside a field. This field is found at the very bottom of the list: beneath smart tags (use the scroll bar to the right.)

| | | |
|---------------------|--|------------|
| General | | Lookup |
| Field Size | | 50 |
| Format | | |
| Input Mask | | |
| Caption | | |
| Default Value | | |
| Validation Rule | | |
| Validation Text | | |
| Required | | No |
| Allow Zero Length | | Yes |
| Indexed | | No |
| Unicode Compression | | Yes |
| IME Mode | | No Control |
| IME Sentence Mode | | None |
| Smart Tags | | |

Text Align

Memo

The Memo data type is very similar to the Text data type. The only real differences between the two are that a memo field can be much larger, up to 65,636 characters (roughly 35 pages of solid text!) Memo fields in Access 2010 also let you only append data to a memo field. That is, when you attempt to add data to a memo field, it will only be added to the end. You cannot overwrite any previous memo information by accident.

| | | |
|---------------------|--|------------|
| General | | Lookup |
| Format | | |
| Caption | | |
| Default Value | | |
| Validation Rule | | |
| Validation Text | | |
| Required | | No |
| Allow Zero Length | | Yes |
| Indexed | | No |
| Unicode Compression | | Yes |
| IME Mode | | No Control |
| IME Sentence Mode | | None |
| Smart Tags | | |
| Text Format | | Plain Text |
| Text Align | | General |

Text Field Size

► To set the text field size

MOUSE

1. Open the table that contains the field that you want to change.
 2. Select the field for which you want to change the field size, and then on the ribbon click the **Modify Fields** tab.
 3. In the **Properties** group, click **More**, and then click **Field Size**.
 4. Enter the new field size in the **Field Size** box. You can enter a value from 1 to 255. This number specifies the maximum number of characters that each value can have. If you need more than 255 characters, use the Memo data type instead.
- For data in a Text field, Access does not reserve space beyond what is necessary to hold actual values. The **Field Size** property is the maximum field value size.

Number Fields

There are three types of number Data Typefields in Access: **AUTONUMBER**, **NUMBER**, and **CURRENCY**. To apply this new format, first open a table in Design view to adjust its field properties. (Date/time is treated as a number for certain reasons but not in this case)

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AutoNumber

The AutoNumber data type is used by Access to automatically count up by one or assign a random number each time a new record is added to a table. AutoNumbers are usually used as primary keys to ensure uniqueness in data. If values 1, 2, and 3 were used as an AutoNumber type, and you delete record 2, the number 2 is not reused as an AutoNumber.

| General | | Lookup |
|------------|---------------------|--------|
| Field Size | Long Integer | |
| New Values | Increment | |
| Format | | |
| Caption | | |
| Indexed | Yes (No Duplicates) | |
| Smart Tags | | |
| Text Align | General | |

Number

The Number data type is a more general number that can be used and formatted in many ways. Field Size indicates what data type the number itself will be: either Integer for whole numbers, or Double for decimal values or very large positive/negative values and/or decimal values. You can also assign an input mask, a default value, and validation rules to a number (we will cover these topics later).

The only limitation on a number field is that the values inputted can only be numbers! If you try to enter any letters of the alphabet, Access will warn you that you are attempting to enter an invalid data type into the field.

| General | | Lookup |
|-----------------|---------------------|--------|
| Field Size | Long Integer | |
| Format | | |
| Decimal Places | Auto | |
| Input Mask | | |
| Caption | | |
| Default Value | | |
| Validation Rule | | |
| Validation Text | | |
| Required | No | |
| Indexed | Yes (No Duplicates) | |
| Smart Tags | | |
| Text Align | General | |

Number Format

You may set the number format once you have set the Data Type from the **FORMAT** dropdown box in the **PROPERTIES** section

| | |
|------------|--|
| Format | Use to display |
| General | Numbers without additional formatting exactly as it is stored. |
| Currency | General monetary values. |
| Euro | General monetary values stored in the EU format. |
| Fixed | Numeric data. |
| Standard | Numeric data with decimal. |
| Percentage | Percentages. |
| Scientific | Calculations. |

Number Field Size

If the field for which you want to change the field size already contains data, consider making a backup of your database before you proceed.

► To change field size

MOUSE

1. In the Navigation Pane, right-click the table that contains the field that you want to change, and then click **DESIGN VIEW**.
2. In the table design grid, select the field for which you want to change the field size.
3. In the **FIELD PROPERTIES** pane, on the **GENERAL** tab, enter the new field size in the **FIELD SIZE** property. You can choose from the following values:
 - **BYTE**— For integers that range from 0 to 255. Storage requirement is a single byte.
 - **INTEGER**— For integers that range from -32,768 to +32,767. Storage requirement is two bytes.
 - **LONG INTEGER**— For integers that range from -2,147,483,648 to +2,147,483,647. Storage requirement is four bytes.
 - Use the Long Integer data type when you create a foreign key to relate a field to another table's AutoNumber primary key field.
 - **SINGLE**— For numeric floating point values that range from -3.4×10^{38} to $+3.4 \times 10^{38}$ and up to seven significant digits. Storage requirement is four bytes.
 - **DOUBLE**— For numeric floating point values that range from -1.797×10^{308} to $+1.797 \times 10^{308}$ and up to 15 significant digits. Storage requirement is eight bytes.
 - **REPLICATION ID**— For storing a GUID that is required for replication. Storage requirement is 16 bytes.
 - Replication is not supported using an .accdb file format.
 - **DECIMAL**— For numeric values that range from $-9.999... \times 10^{27}$ to $+9.999... \times 10^{27}$. Storage requirement is 12 bytes.

Currency

The Currency data type is very similar to the Number data type; the only difference is that a currency is permanently defined as a Double data type.

Data And Time

Choosing the date and time Data Type allows you the following format options in the properties sheet

| | |
|-------------|---|
| Format | Use to display |
| Short Date | Display the date in a short format. Depends on your regional date and time settings. For example, 3/14/2001 for USA. |
| Medium Date | Display the date in medium format. For example, 3-Apr-09 for USA. |
| Long Date | Display the date in a long format. Depends on your the regional date and time settings. For example, Wednesday, March 14, 2001 for USA. |
| Time am/pm | Display the time only using a 12 hour format that will respond to changes in the regional date and time settings. |
| Medium Time | Display the time followed by AM/PM. |
| Time 24hour | Display the time only using a 24 hour format that will respond to changes in the regional date and time settings |

Yes/No

Yes no is used where a checkbox in a datbase would be useful it can have only one of two values

| | |
|------------|------------------------|
| Data Type | Use to display |
| Check Box | A check box. |
| Yes/No | Yes or No options |
| True/False | True or False options. |
| On/Off | On or Off options. |

Not all properties are available for every field. A field's data type determines which properties it has.

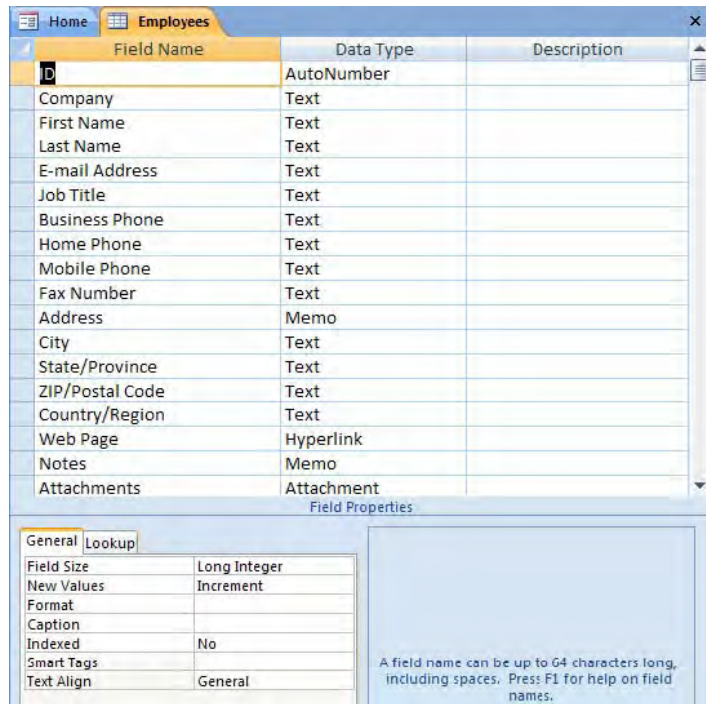
| Field property | Description |
|---------------------|---|
| Field Size | Set the maximum size for data stored as a Text, Number, or AutoNumber data type. For best performance, always specify the smallest sufficient Field Size. |
| Format | Customize the way that the field appears by default when displayed or printed. |
| Decimal Places | Specify the number of decimal places to use when displaying numbers. |
| New Values | Specify whether an AutoNumber field is incremented or assigned a random value when a new record is added. |
| Input Mask | Display characters that help to guide data entry. For more information about creating and using an input mask, see the See Also section. |
| Caption | Set the text displayed by default in labels for forms, reports, and queries. |
| Default Value | Automatically assign a default value to a field when new records are added. |
| Validation Rule | Supply an expression that must be true whenever you add or change the value in this field. |
| Validation Text | Enter a message to display when a value violates the expression in the Validation Rule property. |
| Required | Require that data be entered in a field. |
| Allow Zero Length | Allow entry (by setting the property's value to Yes) of a zero-length string ("") in a Text or Memo field. |
| Indexed | Speed up access to data in this field by creating and using an index. |
| Unicode Compression | Compress text stored in this field when a small amount of text is stored (< 4,096 characters). |
| IME Mode | Control conversion of characters in an East Asian version of Windows. |
| IME Sentence Mode | Control conversion of sentences in an East Asian version of Windows. |
| Action Tags | Attach an action tag to this field. (action tags: Data recognized and labeled as a particular type. For example, a person's name or the name of a recent Microsoft Outlook e-mail message recipient is a type of data that can be recognized and labeled with an action tag.) |
| Append Only | Track the history of field values (by setting the property's value to Yes). |
| Text Format | Choose the property's Rich Text value to store text as HTML and allow rich formatting. Choose the property's Plain Text value to store only unformatted text. |
| Text Align | Specify the default alignment of text within a control. |

Understanding Field Properties

You should now be familiar with the basics of tables and understand fields and rows. In this lesson, we will explore tables in more depth and learn about their attributes and how they can be modified.

Every field in every table in every database has properties. In fact, you will learn that nearly everything in the entire Access program has properties of some type to modify! To see the field properties of a certain field, you must first open a table in Design view. Consider the Employees table from the Northwind sample database:

Field properties are visible in the bottom half of Design view. Each field name has an associated data type. Each data type will have different properties that you can define to make the table contain exactly the data you need. We will explore Field Properties in depth later in this manual.



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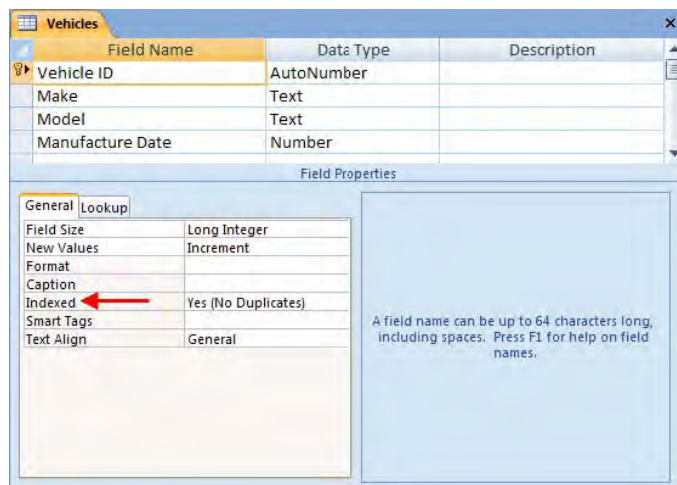
Indexing A Field

An index is designed to help speed up a search. When you look up something in an encyclopaedia, and the subject starts with the letter Q, you are not going to start looking at A in the index and browse until you reach Q! You will start at Q because you know the value is not in any of the sixteen previous letters. The same principle applies to a database.

► To index a field

MOUSE

1. To index a field, first view the table in Design view:
2. The current field, which also happens to be the primary key, is indexed. There are three options when indexing:



No

No indexing will be performed on this field

Yes (Duplicates OK)

The database will allow for multiple rows that have the same field value. Vehicle ID would not use this feature because it is the primary key. But if you have several rows that have the same model name, and have several different models in your database, this option makes database updates slower, but makes searches faster (in the case of very large databases).

Yes (No Duplicates)

The opposite of the above feature; if you have several rows with the same make, only the first row instance will be indexed. This makes database updates faster but will decrease search time somewhat (in the case of very large databases).

- The only data types you can't index are Memos and Hyperlinks.

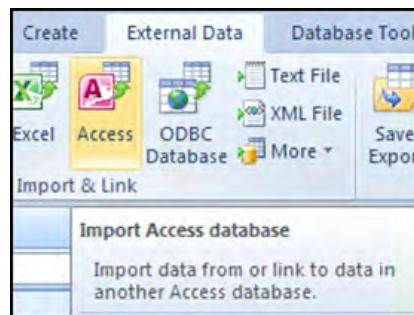
Import A Table From Another Database

We have already covered how Access can import and export data from an external source in the previous section. Access 2010 features import and linking operations together in the same command group located in the External Data ribbon. In this lesson we will explore how to import an entire table from an external source.

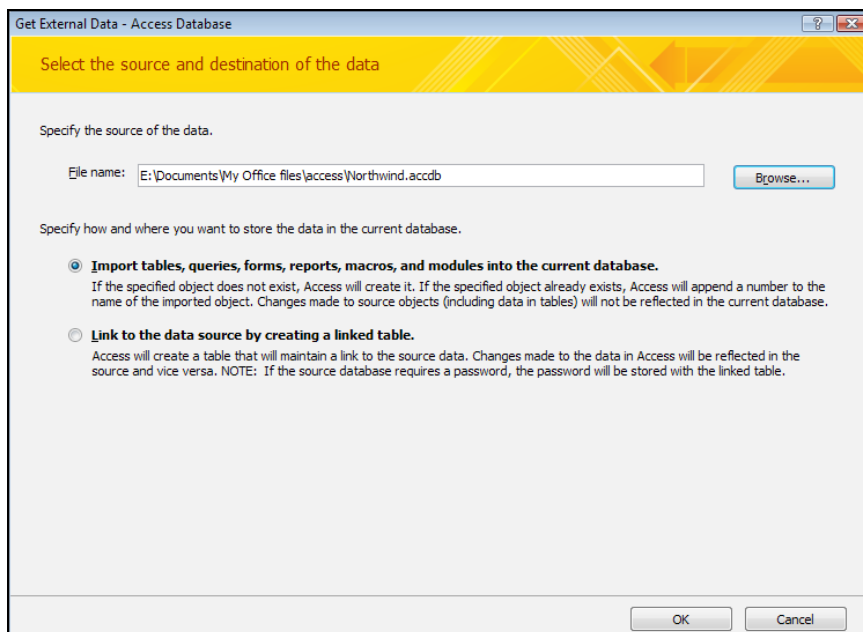
In this example, we will import the contents of a table from the Northwind sample database.

► To import a table

MOUSE



3. Open the destination database and click the Access command in the **EXTERNAL DATA** ribbon:
4. The **GET EXTERNAL DATA – ACCESS DATABASE** dialog box will appear. Click the **BROWSE** button to locate the file and make sure the **“IMPORT TABLES, QUERIES, FORMS...”** radio button is selected:



5. The **IMPORT OBJECTS** dialog box will appear. (next Page) Click each object you want to import one at a time from the Tables tabs at the top (or click Select All to highlight all under a single tab).
6. For more advanced options and to change how Access will import objects, click the **OPTIONS** button:

Try this...



The sequence 2, 4, 6, 8, 10, 12, 14, 16, ... is the sequence of even whole numbers. The 100th place in this sequence is the number...?

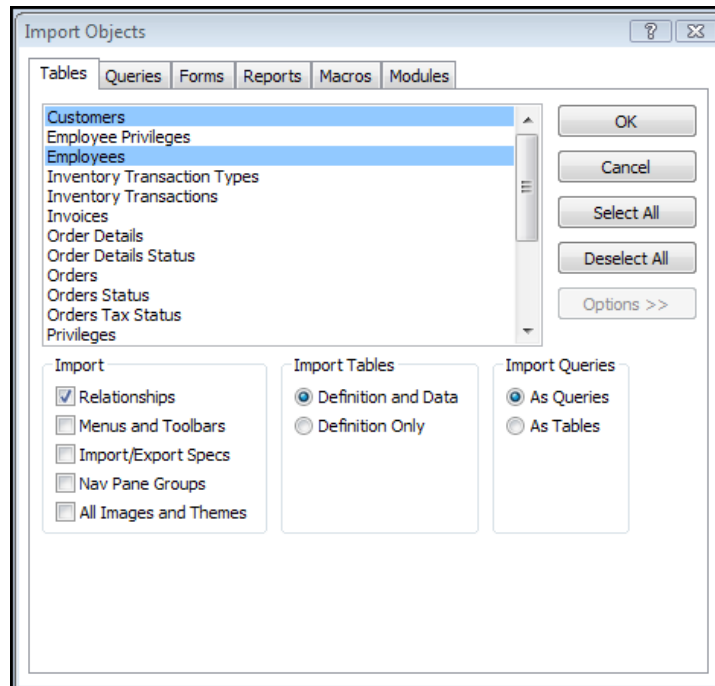
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7. Click **-OK-** and the entire selected table will be imported into your database. Access prompts you to save the import operation if you like. The table will be displayed in the **TABLES OBJECT** page of the Database window. Since you have imported the data (as opposed to linking it) you have full access to do whatever you like to the data. The source file will not be touched.



Relationships

Standard database design protocols

- When naming an object prefix it with tbl for table qry for query frm for form etc.

These prefixes make it easy to identify an object when they have similar names such as TblCustomer and FrmCustomer

- When naming an object capitalise each word and use no spaces

This will be memorable and easier to use in the building of calculations the captions option in the field properties allow the user to see the name of the field in a normal way with spaces or any other characters you wish to use.

- Only use letters and numbers in the field name.

Many characters outside the alphabet are reserved for specific use and even when not make it harder to create calculations later on.

- Always refer to the object in the singular

This then will be a memorable standard when performing advanced expression and calculation building

Creating Table Relationships

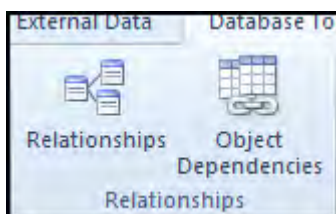
In this section we will explore the staple that really makes a database work: the relationships that are established between the different tables of data. When designing a database, this is the most challenging step and often the place where most of the confusion with databases arises. Fortunately, databases are nothing more than tables of data that are related.

Consider the following simple database

| Expenses | | | | Employees | | | | |
|-------------|-----------|--------------|--------|-------------|-------------|----------------|----------|-------|
| Employee ID | Date | Expense Type | Amount | Employee ID | Name | Address | Phone | Title |
| 2 | 5/7/2006 | Erasers | 10 | 1 | Bugs Rabbit | 44 Carrot Dr | 555-1212 | CEO |
| 2 | 5/25/2006 | Lunch | 50 | 2 | Elmer Funn | 123 Wabbit Way | 555-9876 | VP |
| 1 | 6/1/2006 | Flight | 600 | | | | | |

Imagine your database has a table of employees, and a table of expenses that have been made by your employees. As time goes by, the Expenses table will grow to become quite large. You wish to make a query that will find out the phone number of every employee that submitted an expense. It is impractical to place the employee phone number in the same table as the expenses. It will create a lot of extra data that is not really needed if there is another table containing employee data elsewhere. The relationship between the two tables is created because of the two common fields, -EmployeeID-. In particular, the Employees table and the Expenses table are in a “one-to-many” relationship, meaning that one entry in the Employees table can relate to many entries in the Expenses table.

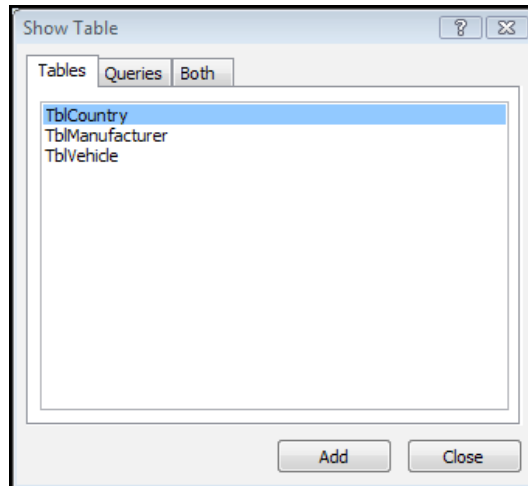
Knowing this, we can add two relationships to our expanded Vehicles Database. You can view the relationships by clicking the Relationships command in the Database Tools ribbon:



► To access relationships

MOUSE

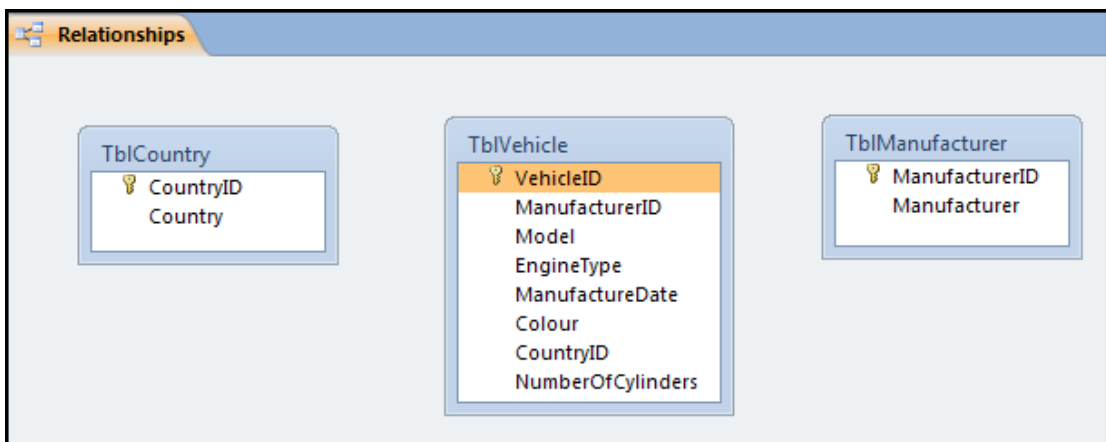
1. Ensure tables are saved and closed (good practice)
2. On the database tools ribbon, relationships group click on the relationships button
3. A tab will appear in the main window called relationships.



4. A dialogue will be in front of the window asking which tables you would like to add.
5. Double click each table you would like to appear in the relationship window

OR

1. Select a table and click the **ADD** button.
2. When all tables are added click **CLOSE**
3. The relationship window should appear as below



- You may click with your left mouse button on the titles of these objects to drag they around and reposition them
- You may move your mouse to a border where a resize (double arrow) handle will allow you to change the size of the object.

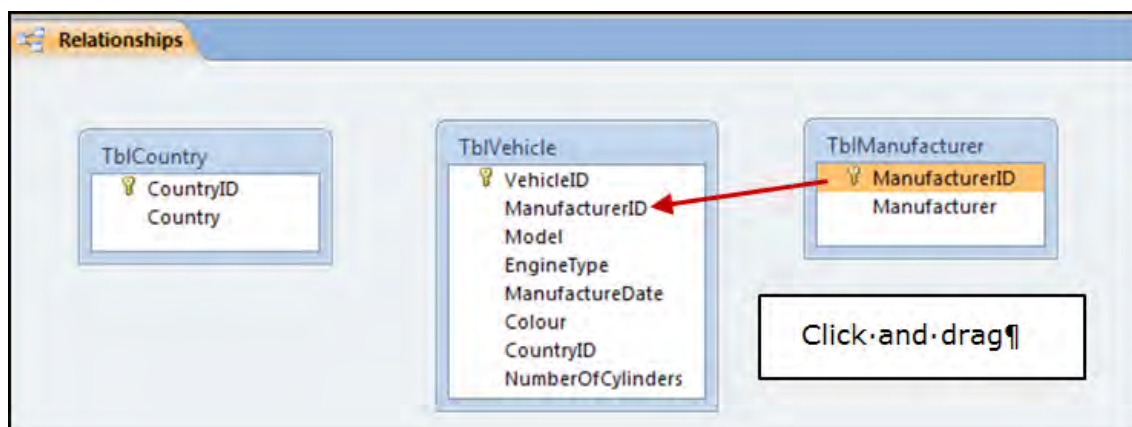
Instead of naming every country and manufacturer in the Vehicles table, we can lighten the size of the Vehicles table by taking those two pieces of information and storing them in a separate location. In a database of this size this may not seem like that big of a deal, but as we proceed through this manual, the reasoning will become clearer.

Make and Country in the previous Vehicles table are replaced by ManufacturerID and CountryID. The TblManufacturer and TblCountry tables listed above contain only the respective ID and name for each record. However, Access does not automatically recognize the relationships by itself; we must tell it which fields relate in these tables.

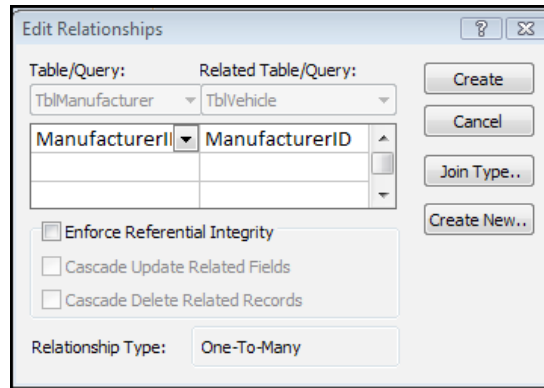
► To create a relationship

MOUSE

1. Click on the **DATABASE TOOLS** ribbon, Show hide group, relationships button to show relationships window.
2. The contextual design ribbon appears click on the **SHOW TABLE** button in the relationships group.
3. Add tables you wish to relate click on **CLOSE**.
4. To establish a relationship between the Vehicles and Manufacturers tables, simply click and drag the Manufacturer ID field from one table to another:



5. When you release the mouse button, you will see the **EDIT RELATIONSHIPS** dialogue box:



- Access has determined that the style of this relationship is **ONE-TO-MANY**, based on the data that was collected from the drag and drop operation. Before clicking the **CREATE** button, you should click the **ENFORCE REFERENTIAL INTEGRITY CHECK BOX**.

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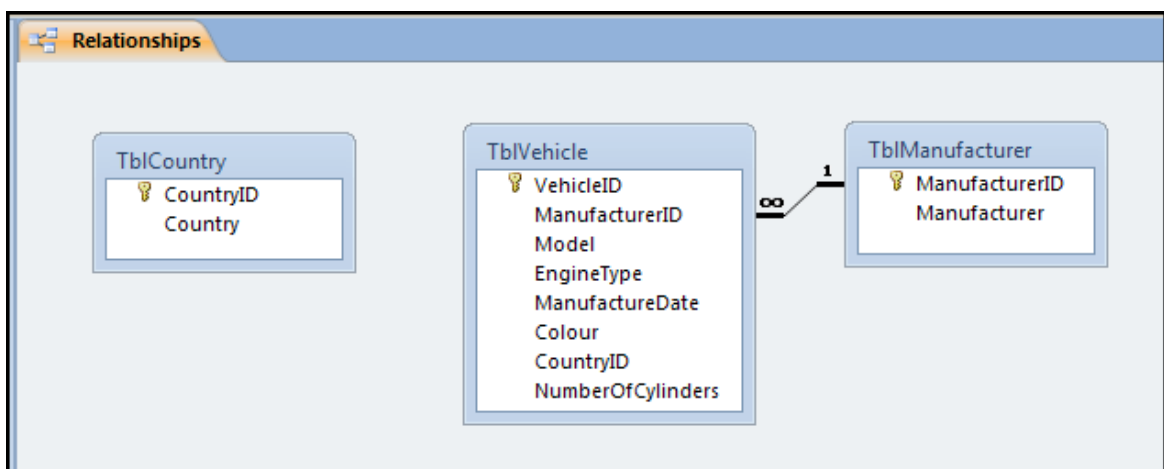
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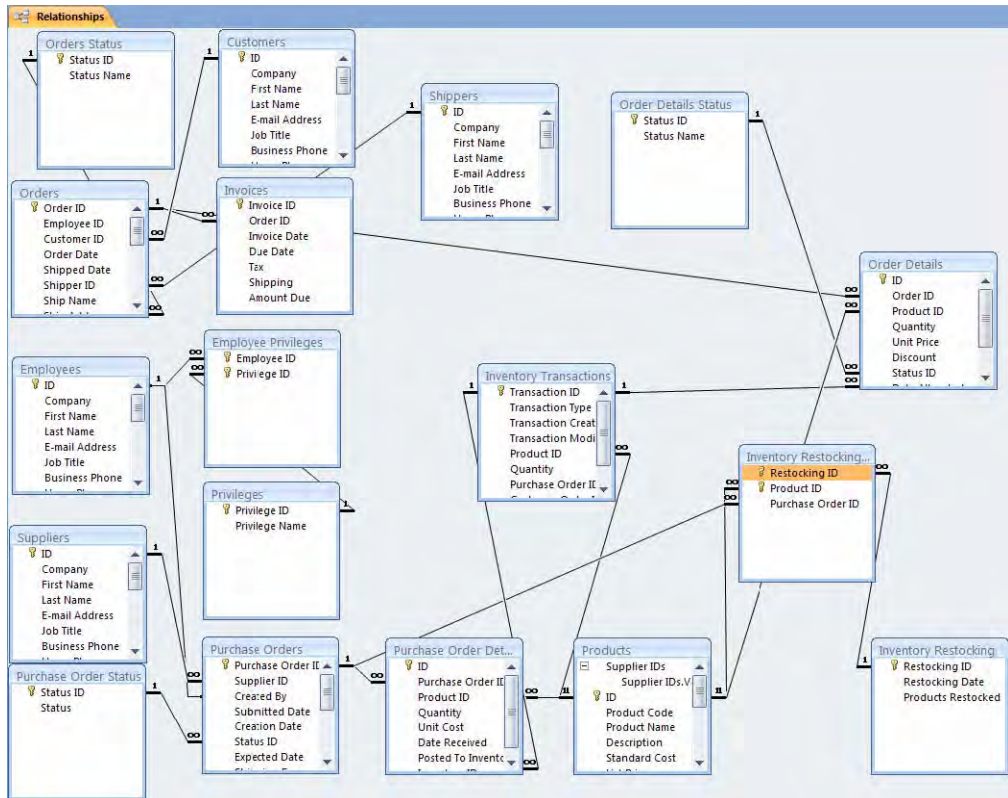
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Referential Integrity is a set of rules and conditions that make data entry into databases safer. You should try to enforce referential integrity whenever possible. It insures that all related fields are valid when considered together in a database, and prevents you from accidentally deleting related data. To make referential integrity work, the following three conditions must be satisfied:

- The matching field from one table is a primary key or has a unique index. (True: ManufacturerID is the primary key)
 - The fields in the relationship have the same data type. (True: both fields are numerical)
 - Both tables are stored in the same database. (True: both tables are in the same database file, not a linked table.)
7. Since all of the necessary conditions have been satisfied, click **CREATE** to establish the relationship:

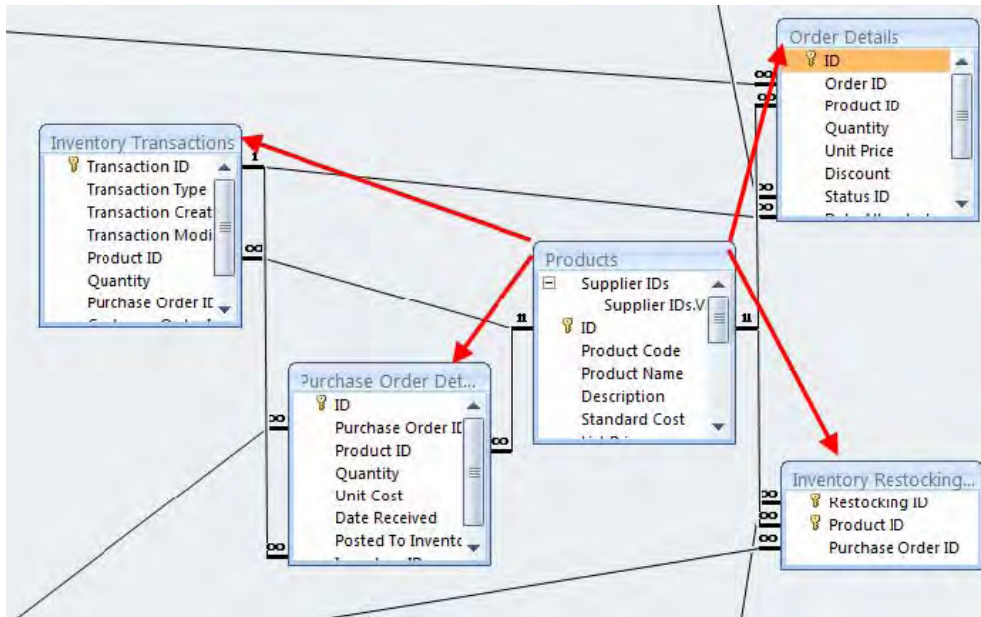


8. You can see the **ONE-TO-MANY** relationship in the diagram above. One ManufacturerID from TblManufacturer may correspond to many ManufacturerID's from TblVehicle.
9. Create the country relationship in the same way.
10. Now let's examine the relationships in the Northwind sample database. As you can see in the diagram below, there is a lot of action happening in this database!

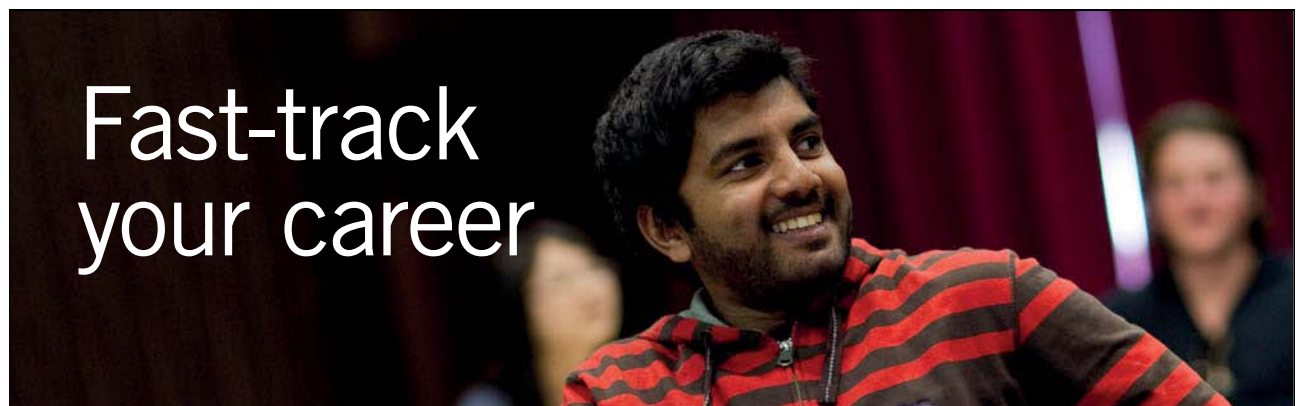


11. Let's examine the Products table in this database: (Next page)

Each product record contains many attributes describing the nature of the product that Northwind sells, one of which is an ID field. In fact, each relationship in the Product table is based on the ID field. There are four relationships denoted by black lines coming from the ID field, relating to Inventory Transactions, Purchase Order Details, Inventory Restocking Details, and Order Details. Consider the relationship with the Order Details table. One product that Northwind sells has the potential to be sold many times, therefore each sale of each product is logged in the Order Details table. The Products table is in a one-to-many relationship with the Order Details table.



Creating the relationships is very simple if the fields in your tables have been well planned; simply drag and drop fields. The Northwind database does not follow the principals of naming we looked at earlier so it may prove to be difficult later to deal with calculations very untidy.



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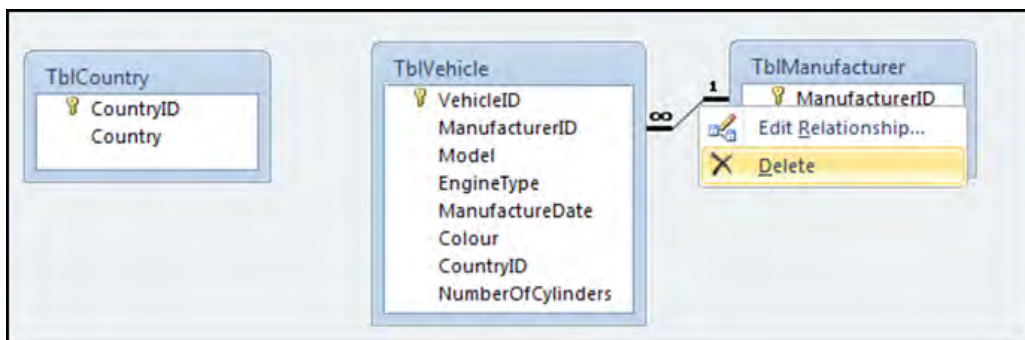
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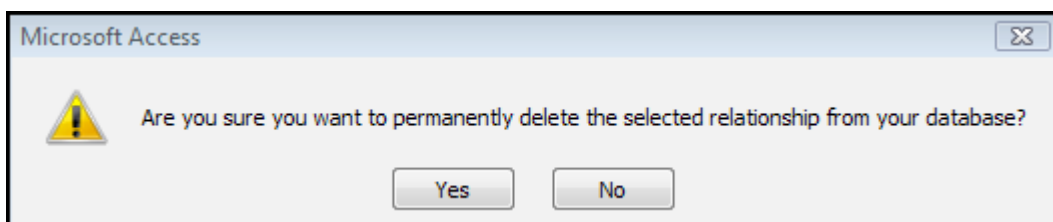
Deleting Relationships

When deleting a relationship, remember that doing so can have a big impact on how the database works. Make sure you actually do need to remove the relationship!

1. Deleting a relationship in the Relationships window is easy, just right-click on the relationship you want to remove and click Delete:



2. Access confirms that you want to delete the relationship,



3. Click -Yes- to confirm.

Controlling Data Entry In a Table.

In this lesson of this section, we will explore some more advanced table data entry techniques. These methods, combined with all of the controls that can be enforced from previous sections, help protect your database from bad data entry.

Data Validation Numerical Data

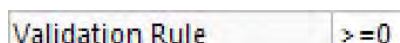
In addition to adding protection like required values and input masks, you can also add validation rules to your database to ensure that data entered makes sense.

► To create a rule

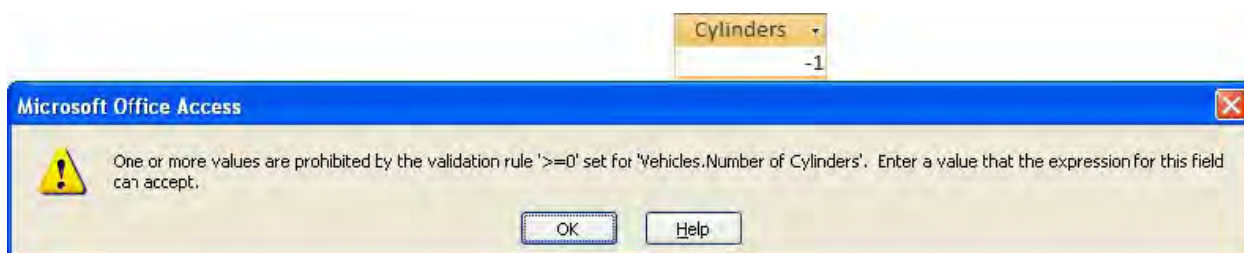
Consider the Vehicles table. The Number of Cylinders field has a default value of 6 and the Field Size is defined as Integer, which prevents decimal numbers from being entered. The field Description states that if a vehicle is equipped with a rotary engine (one that has no cylinders) that 0 should be the value. Therefore, a data entry is valid if it is a whole number greater than or equal to zero. However, no precautions are in place to prevent someone from entering a negative number of cylinders, a data entry that does not make sense.


MOUSE

1. By clicking in the Validation Rule box, you can enter a simple expression, ≥ 0 .



2. This will prevent someone from entering a negative number of cylinders:



3. Back in Design view, you can click the  button beside the Validation Rule field to launch the Expression Builder:
4. The Expression Builder lets you create customized validation rules, expressions, logical functions, and much more. We will explore the basic functionality of the expression builder later in this manual.

Remember although the default value is 6 cylinders someone may enter 60, 1000, 50,000. To limit the number of cylinders entered add more conditions using the “AND” or “OR” operators to set a range of values that may be entered.

5. To limit the entries to a range of values instead of just entering ≥ 0 we could add the AND command and enter a second condition to create the value range greater than zero and less than 12
 ≥ 0 AND ≤ 12
6. Enter some explanatory validation text which will be the prompt (error Message that will appear if incorrect data is entered
7. Try this and see the error message at any value outside this range.

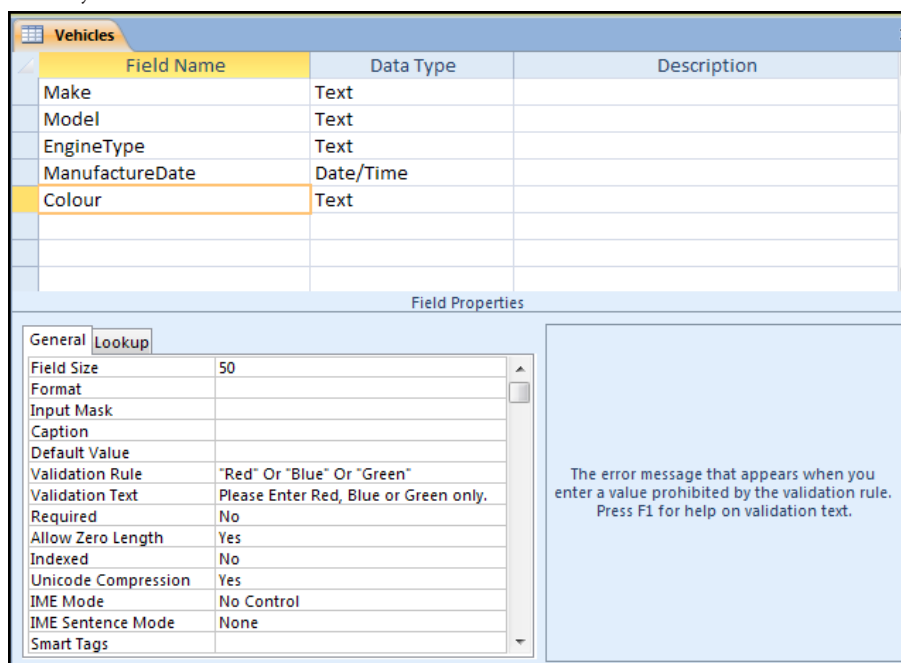
Data Validation Textual Data

As another example of validation consider the vehicle table we cannot use the >(greater than or less than)< signs when referring to text we are looking to allow entry only of specific strings of text. For instance if the cars in the previous example were only made in specific colours say Blue, Red and Green we would not want anyone to enter either a misspelling or a different colour.

➤ To validate text

MOUSE

1. Open the vehicles table in design view
2. Select the colour field
3. In the validation box enter the values Red or Blue or Green and press return.
4. Access will adjust the validation rule to read “Red” Or “Blue” Or “Green”

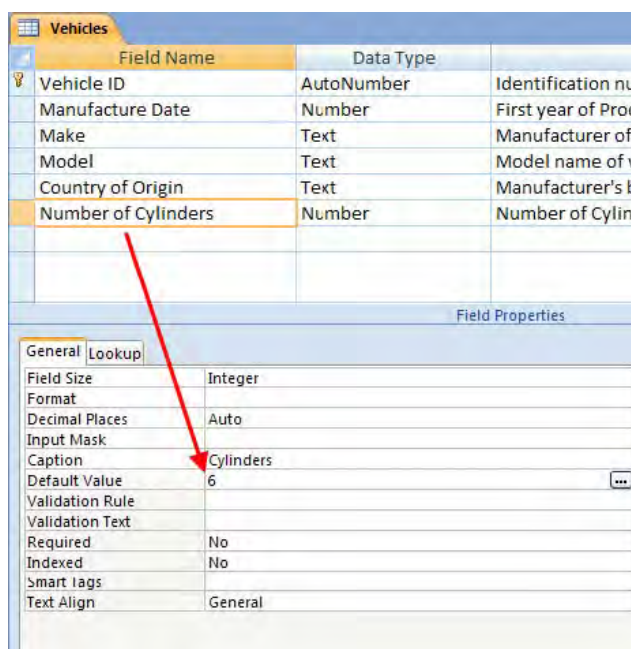


5. Enter some explanatory validation text which will be the prompt (error Message that will appear if incorrect data is entered
6. The colours are text strings and the word OR is recognised as a command in access, when data is entered in this field now only one of those three colours will be allowed to be entered in the cell any variation on these values will give an error message.
7. Further criteria for building validation will be seen later in the filtering and queries sections.

Setting A Default Value

A default value is something that is always present in a particular field whenever a new record is made.

E.G.If you own a company with its base of operations in New York, you can assign a default value of 'New York' in all of the address fields you might use in a database. Every time you go to enter a new employee's information or customer invoice, the city field will always be 'New York' until you change it to something else.

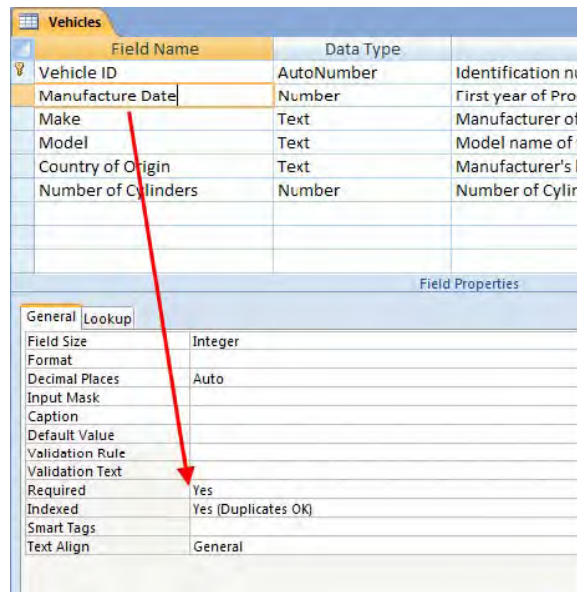


► To create a default value

MOUSE

1. Open a table in **DESIGN** view, click the field you want to give a default value,
2. Type a default value in its corresponding field property. In our example, we will make the default number of cylinders 6:

Setting A Required Value



A required value is a value that must be entered into a record in order for the database to be considered complete. If you have ever filled out a form on the Internet, you usually see an asterisk (*) beside fields that must be entered in order for a data entry to be valid:

3. Making a value a required value is as simple as clicking **YES** or **NO** in the -Required- combo box:



Creating A Lookup Field

The current Vehicles table has been populated with some information. We already established the relationships with the Countries and Manufacturers tables. However, having a Manufacturer ID of 3 and a Country ID of 5 is not very meaningful when looking just at the Vehicles Table:

| Vehicle ID # | Manufacture Date | Manufacturer ID | Model | Country ID | Cylinders |
|--------------|------------------|-----------------|---------------|------------|-----------|
| 1 | 1982 | 1 | Corvette | 1 | 8 |
| 2 | 2003 | 2 | V12 Vanquish | 2 | 12 |
| 3 | 2000 | 3 | S2000 | 4 | 4 |
| 4 | 2003 | 4 | Tiburon | 5 | 4 |
| 5 | 2002 | 5 | 575 Marinello | 3 | 12 |
| 6 | 1979 | 6 | Spider | 3 | 4 |
| 7 | 1965 | 7 | Falcon | 1 | 8 |

Lookup Wizard

Fortunately, Access features something called a lookup field. It allows you to use the actual Manufacturer name and Country name to enter data in the field. Creating a lookup field is easy; however you must first delete the relationship(s) that exist in the field.

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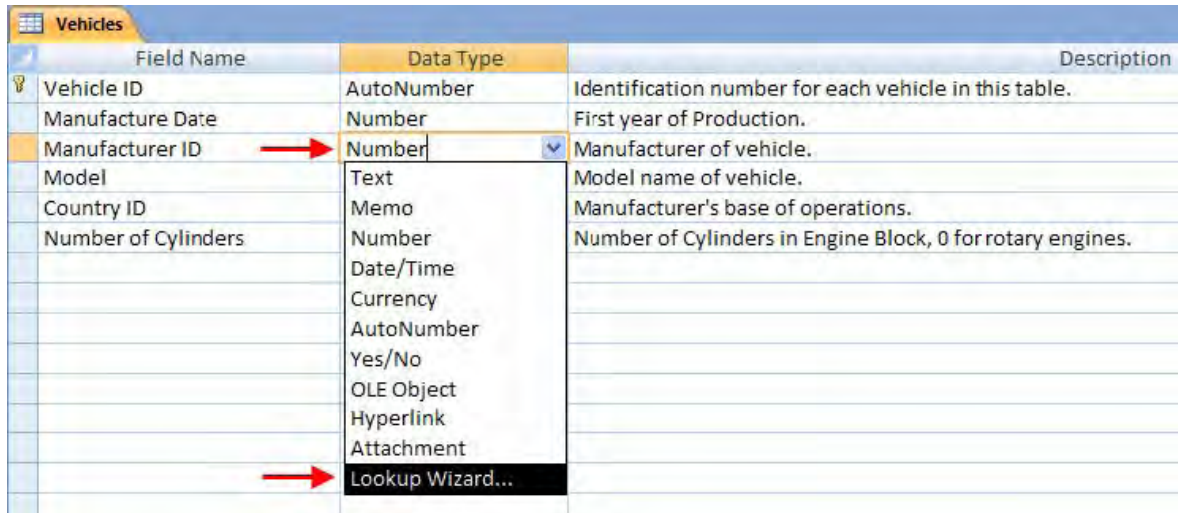


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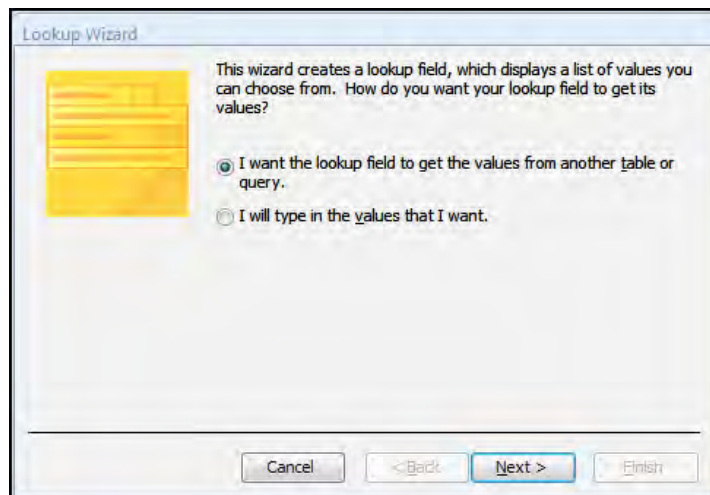
► To use the lookup wizard

MOUSE

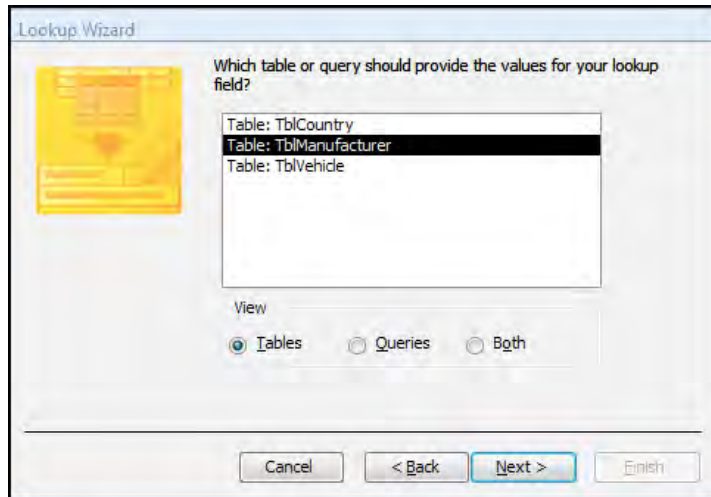
1. First, open the **VEHICLES** table in **DESIGN** view. Click in the **DATA TYPE** cell of the field you want to turn into a lookup table and click **LOOKUP WIZARD**.



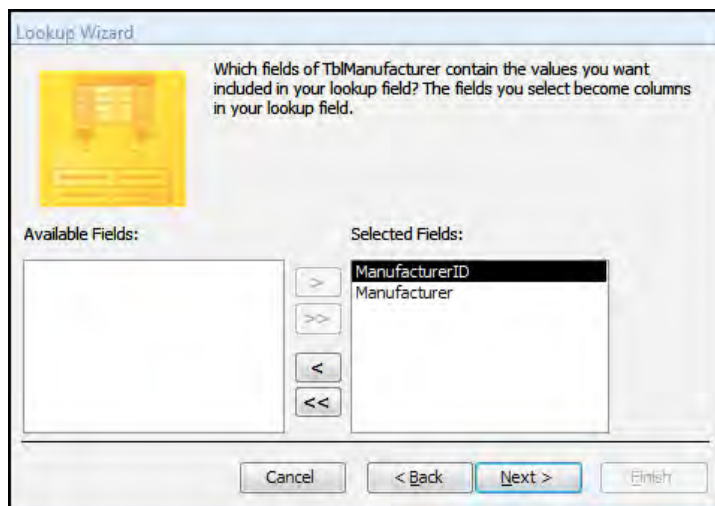
2. The **LOOKUP WIZARD** will appear.
3. Select the data source you will use for your lookup field. In our case, we want to use the data contained in the **MANUFACTURERS** table: (next Page)



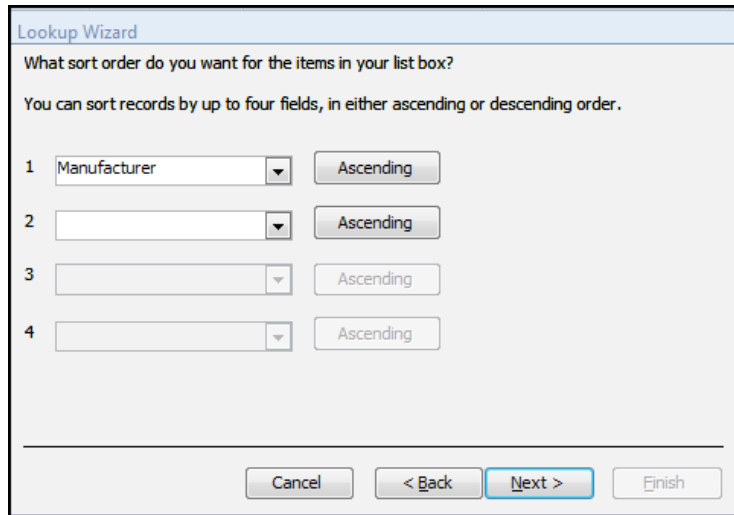
4. The next step allows you to choose which table (or query) contains the lookup values; in our case the **MANUFACTURERS** table:



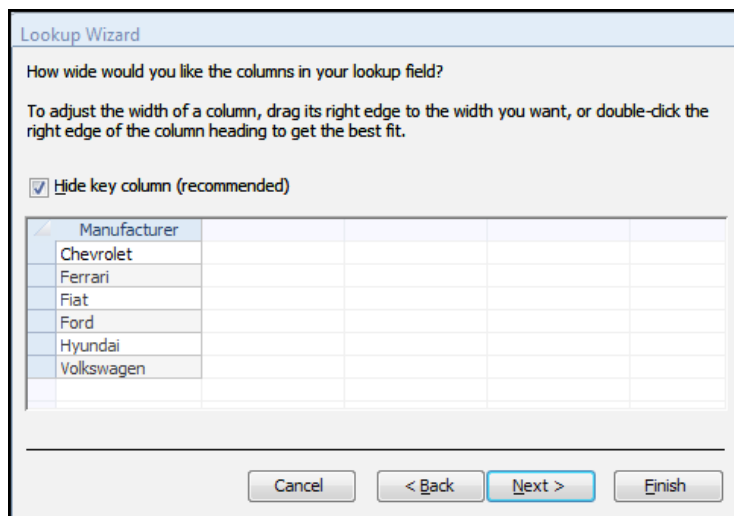
5. The next step lets you choose which field or fields in the source table you want to use for your lookup field. In our case, we want to show the Manufacturer name instead of just the ID:



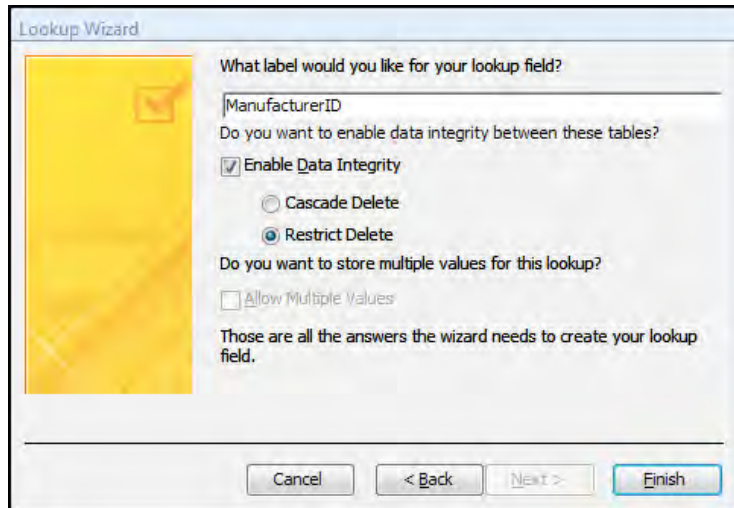
6. In the next step you have the option to sort the values that will appear in the field in ascending or descending order. If you do not specify anything in this step, Access will automatically apply an ascending order on the field that was used to create the filter:



7. The next step allows you to move your mouse to the edges of the column and click and drag to adjust the size. You can also opt to show the **PRIMARY KEY COLUMN**, which will show the corresponding primary key for each value in the lookup field:



8. The final step of the Wizard will give the lookup field a name. and allow you to enable data integrity This will replace the column name of Manufacturer ID. Click **FINISH**:



- Return to Datasheet view once the Wizard completes. If you click in the **MANUFACTURER'S NAME** column of data, the field becomes a combo box. If you need to change the value to something else, click the pull-down arrow to see a list of available values:

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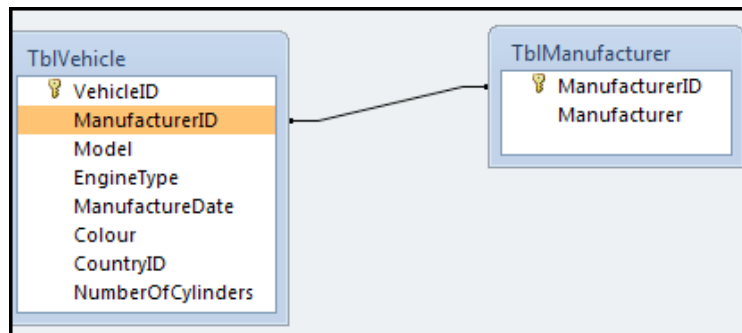
It's only an opportunity if you act on it

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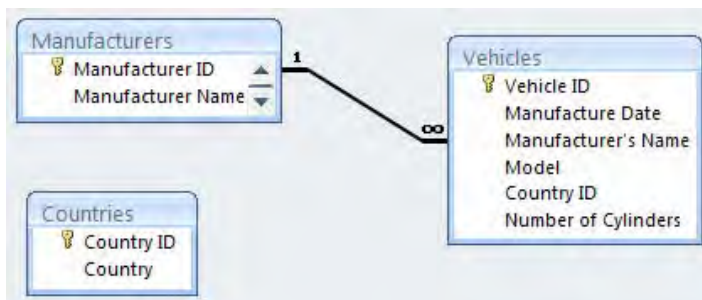
| Vehicle ID # | Manufacture Date | Manufacturer's N | Model | Country ID | Cylinders | Add New Field |
|--------------|------------------|------------------|---------------|------------|-----------|---------------|
| 1 | 1982 | Chevrolet | Corvette | 1 | 8 | |
| 2 | 2003 | Aston Martin | V12 Vanquish | 2 | 12 | |
| 3 | 2000 | Honda | S2000 | 4 | 4 | |
| 4 | 2003 | Hyundai | Tiburon | 5 | 4 | |
| 5 | 2002 | Chevrolet | 575 Marinello | 3 | 12 | |
| 6 | 1979 | Aston Martin | Spider | 3 | 4 | |
| 7 | 1965 | Honda | Falcon | 1 | 8 | |
| * | (New) | Hyundai | | | 6 | |

10. As part of the lookup field creation process, Access created a basic relationship between the **VEHICLES** and **MANUFACTURERS** table:



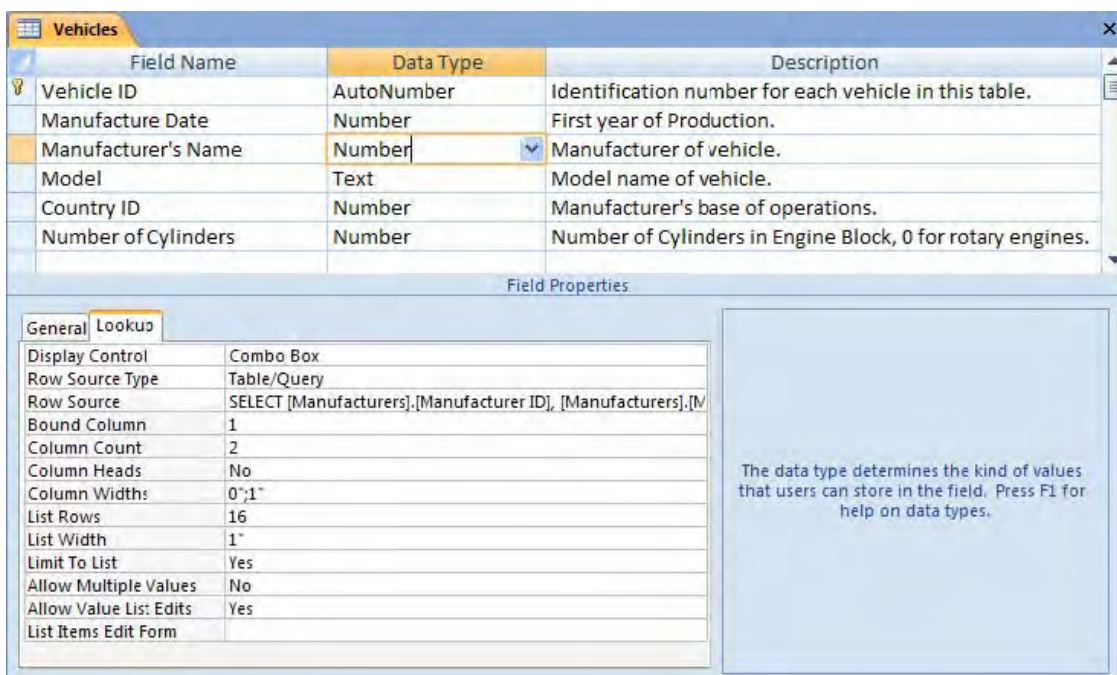
11. However, the relationship is not a strong one. Right-click the black line joining the two tables and click **EDIT RELATIONSHIPS**:

- Click the **ENFORCE REFERENTIAL INTEGRITY** check box and click **OK**. The full relationship will be restored:



Modifying A Lookup Field

Now that you know how to establish a lookup field, you can modify certain characteristics of the field to suit your database's needs. If you open a table in Design view, you can view the lookup field properties by clicking the **LOOKUP** tab at the bottom of the window:



The following properties are available to adjust:

Display Control

You can choose between a Text Box, List Box, or Combo box for the lookup field.

Row Source Type

You can specify between Table/Query, Value List, or Field List.

Row Source

The query or data that the lookup field uses.

Bound Column

Lists how many columns that currently constitute the lookup field.

Column Count

Number of columns that are available to use as a lookup field.

Column Heads

Can specify Yes/No if a field label, caption, or first row of data used to construct the lookup field values will be used.

Column Widths

Lists the dimensions of the columns used in the lookup field. The number of columns in the Column Count field, are the same number of dimensions listed here.

List Rows

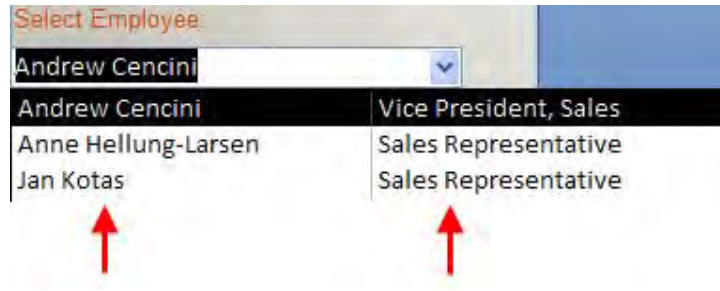
Maximum number of rows that are displayed if combo box is the specified Display Control.

List Width

Width of the combo box if specified as Display Control.

Limit to List

Forces user to use only the values in the lookup field; that is they cannot enter any data not specified by the query.



Allow Multiple Values

Access 2010 allows you to view multiple items in the lookup column at once, just like the login screen for the Northwind sample database:

Allow Value List Edits

Lets you edit the values that are contained in the lookup column.

List Items Edit Form

If the above property is set to Yes, specify which form you wish to use in order to modify the lookup values.

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Creating A Lookup VALUE List

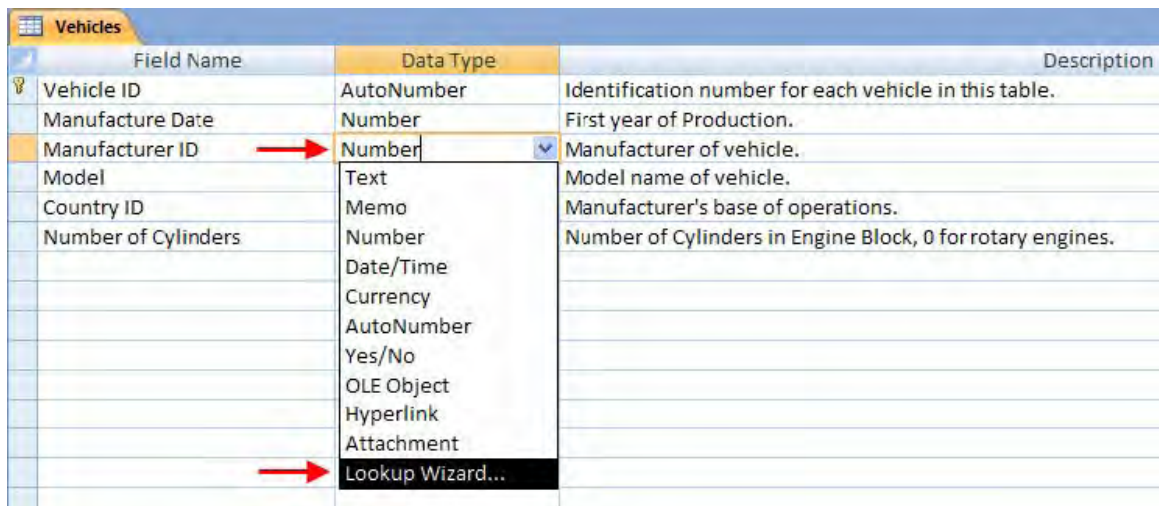
We have seen in the last section of this lesson that you can use a table to retrieve lookup field values. However, Access gives you the ability to specify the values that can be used in a lookup field yourself.

In this example, we will help prevent improper data from being entered into the Number of Cylinders field of the Vehicles table. We will create a value list that will let a user pick how many cylinders a car has from a list of options.

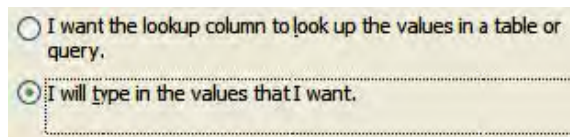
► To create this value list,

MOUSE

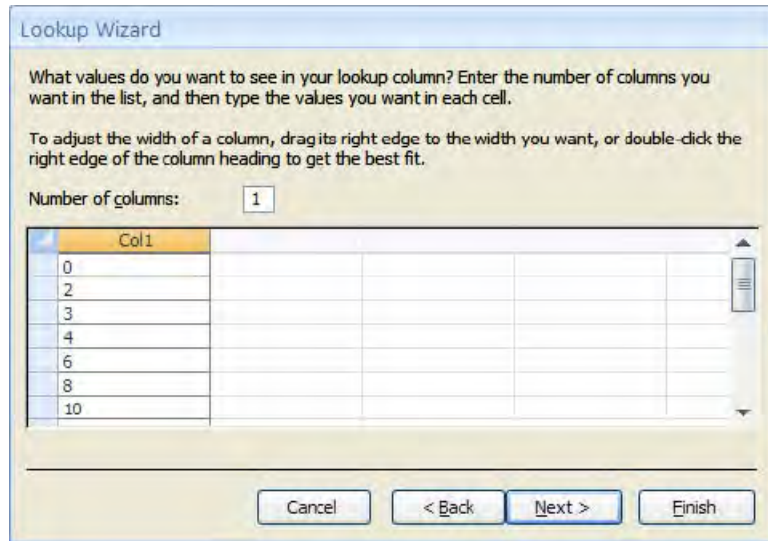
1. open the **VEHICLES** table and enter **DESIGN** view.
2. In the **DATA TYPE** field of **NUMBER OF CYLINDERS**, select **LOOKUP WIZARD**.



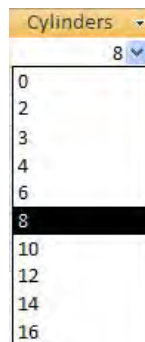
3. The **LOOKUP WIZARD** window will appear. Select the second radio button “**I WILL TYPE IN THE VALUES THAT I WANT**” and click **-NEXT-**:



4. The next page of the Wizard is where you enter the values you want to use for the value list.



5. In this page of the Wizard you can specify the number of columns for the value list and which values you want to include in the list. (The majority of lookup fields/value lists you will use will only be a single field at a time.) Click your mouse inside the first cell, type a value, and press **TAB** on your keyboard to move to the next cell. When you have entered the list of values you want to use, click **-NEXT-**.



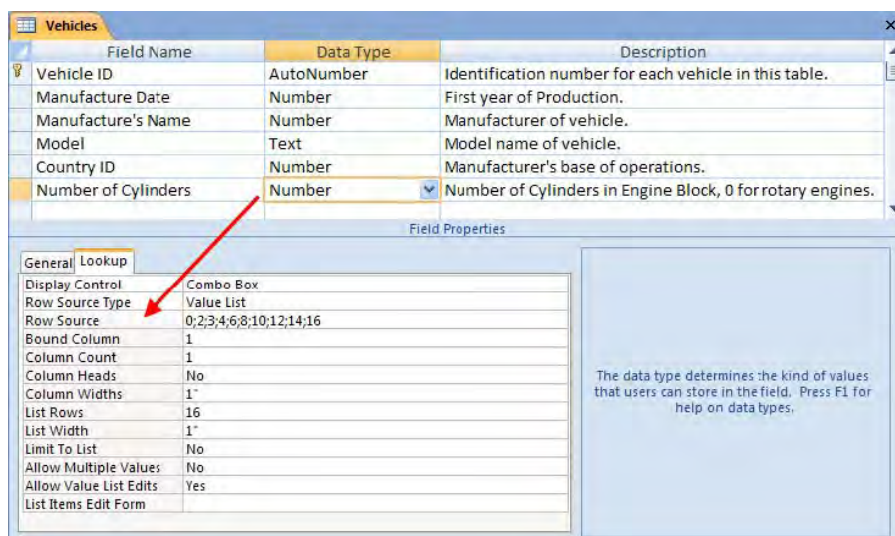
6. The final step of the Wizard asks you to name the lookup column (value list). The default name is the same name as the field, but you can name it whatever you like. Click **FINISH** to complete the Wizard.
7. If you open Datasheet view for the table you will be able to use the combo box to fill in a value for the field.

Modifying A Lookup VALUE List

Modifying the properties of a value list is essentially the same as those for a lookup field.

► To modify a value list

MOUSE

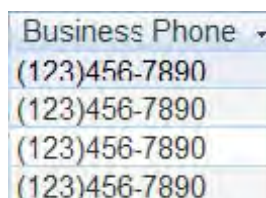


1. Click the **LOOKUP** tab located at the bottom of **DESIGN** view:
2. The only difference between this value list and any lookup field is the ability to see and modify all of the values currently assigned in the **ROW SOURCE** field. You can add or delete as many as you like, but make sure that each value is separated by the delimiting semicolon.

We will continue our examination of tables in this lesson by learning how to make table entry even more precise, further eliminating the risk of having bad or incorrect data entered into the database. We will look further into lookup fields later on.

Creating And Using Input Masks

An input mask is defined as a type of template that is used when entering data into a field that follows some sort of format. For example, the phone number 4827482234 is much harder to read than (482) 748-2234. Access can set up input masks to make sure data is entered completely and correctly. The Employees table in the Northwind sample database makes use of such an input mask:

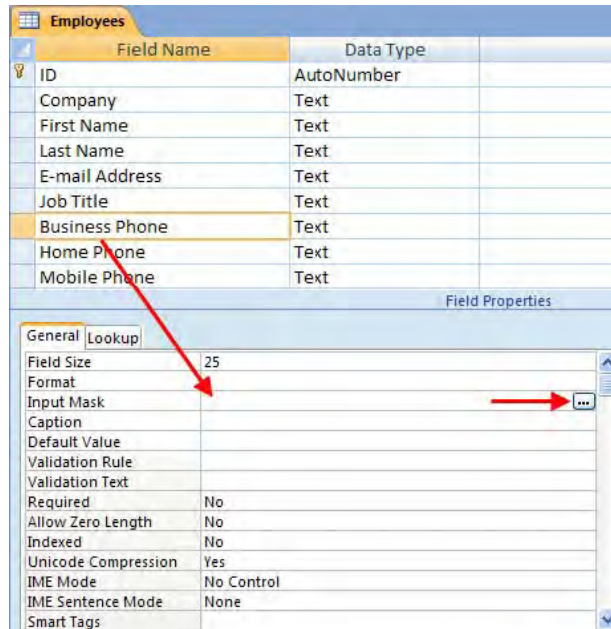


An input mask is A format that consists of literal display characters (such as parentheses, periods, and hyphens) and mask characters that specify where data is to be entered as well as what kind of data and how many characters are allowed.

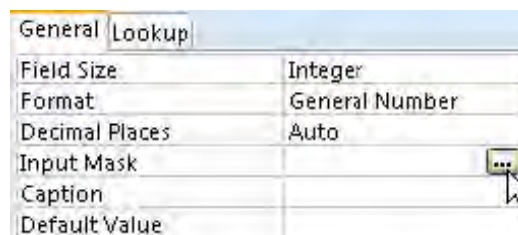
► To create an input mask

MOUSE

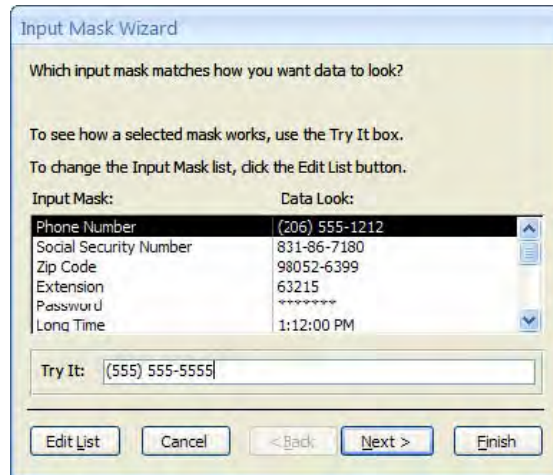
1. Different data types have different input masks. To setup or modify an input mask, open a table in **DESIGN** view:



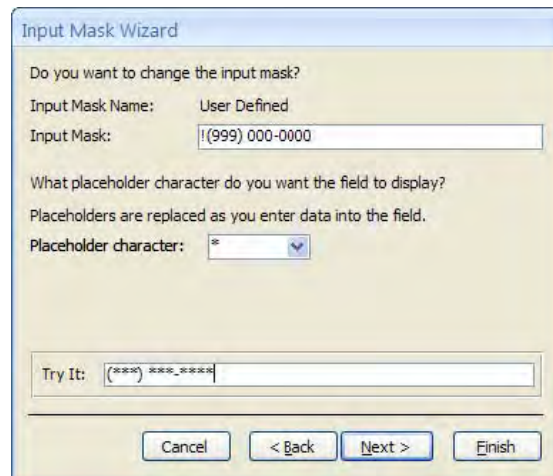
2. Then, open the field's **PROPERTIES** and find a field that does not offer the option to type or choose from a combo box. Click it and a small symbol will appear (⋮) on the right-hand side.



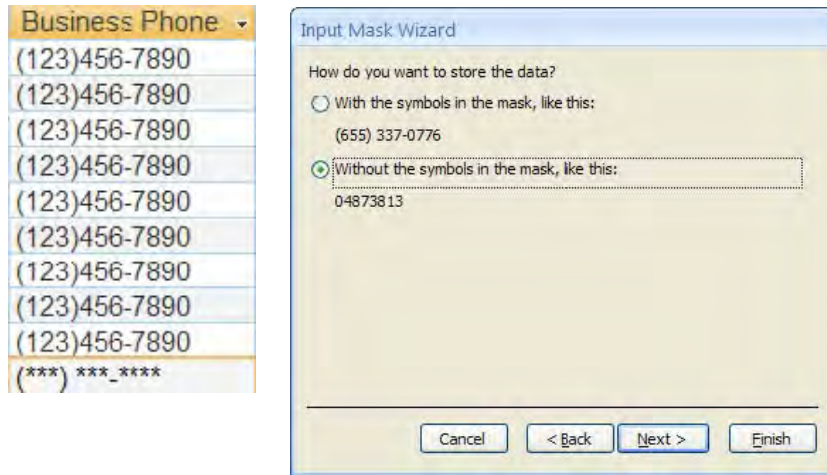
3. Click it to start the **INPUT MASK WIZARD**:
4. Here you can select from the various input masks that are available. The first option is the phone number mask; give it a try by clicking in the Try It: text box and typing. Click Next.



5. Here you can change the placeholder character to some other symbol than the underscore character. Click **NEXT**.



6. You can choose how you would like to store the data in the table, either with the symbols or without the symbols. If you choose to keep the symbols in the database to make the data easier to read, you must make sure the data type for the Phone Number field is Text as non numerical characters are not allowed in a Number field. Click -Next-,
7. Click **FINISH**- to complete the Wizard. If you close the Employees table Design view, and then open the table in Datasheet view, you will see that the Phone field has the input mask applied to it:



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Input mask Syntax

Microsoft Access interprets characters in the **Input Mask** property definition as shown in the following table. To define a literal character, enter any character other than those shown in the table, including spaces and symbols. To define one of the following characters as a literal character, precede that character with a backslash (\).

| Character | Description |
|-----------|--|
| 0 | Digit (0 through 9, entry required; plus [+] and minus [-] signs not allowed). |
| 9 | Digit or space (entry not required; plus and minus signs not allowed). |
| # | Digit or space (entry not required; blank positions converted to spaces, plus and minus signs allowed). |
| L | Letter (A through Z, entry required). |
| ? | Letter (A through Z, entry optional). |
| A | Letter or digit (entry required). |
| a | Letter or digit (entry optional). |
| & | Any character or a space (entry required). |
| C | Any character or a space (entry optional). |
| . , ; - / | Decimal placeholder and thousands, date, and time separators. (The actual character used depends on the regional settings specified in Microsoft Windows Control Panel.) |
| < | Causes all characters that follow to be converted to lowercase. |
| > | Causes all characters that follow to be converted to uppercase. |
| ! | Causes the input mask to display from right to left, rather than from left to right. Characters typed into the mask always fill it from left to right. You can include the exclamation point anywhere in the input mask. |
| \ | Causes the character that follows to be displayed as a literal character. Used to display any of the characters listed in this table as literal characters (for example, \A is displayed as just A). |
| Password | Setting the InputMask property to the word Password creates a password entry text box. Any character typed in the text box is stored as the character but is displayed as an asterisk (*). |

Input mask examples

The following table shows some useful definitions and examples of values you can enter into them.

| Input mask definition | Examples of values |
|-----------------------|---|
| (000) 000-0000 | (206) 555-0248 |
| (999) 999-9999! | (206) 555-0248 or() 555-0248 |
| (000) AAA-AAAA | (206) 555-TELE |
| #999 | -20 |
| | 2000 |
| >L????L?000L0 | GREENGR339M3 orMAY R 452B7 |
| >L0L 0L0 | T2F 8M4 |
| 00000-9999 | 98115- |
| | 98115-3007 |
| >L<??????????????? | Maria |
| | Pierre |
| ISBN 0-#####-0 | ISBN 1-55615-507-7 orISBN 0-13-964262-5 |
| >LL00000-0000 | DB51392-0493 |

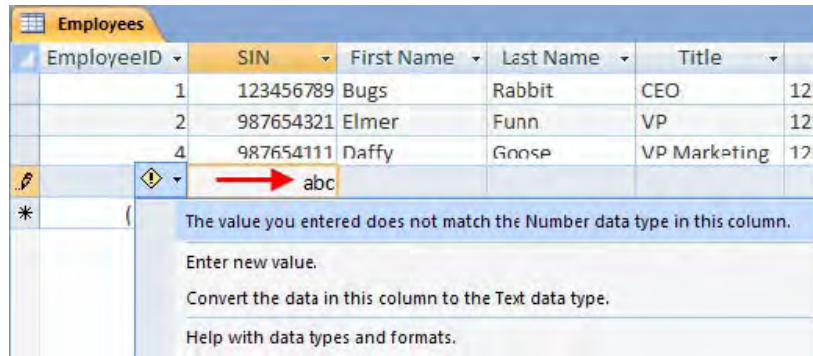
Enter Data In a Table

Using A Table

Access 2010 provides you with a few ways of entering data. You can enter in the data manually, use a form, or use the Import commands in the External Data ribbon.

► To enter data manually

1. Open a table in Datasheet view by double-clicking its name in the Navigation Pane. If you make an error while entering data, like accidentally entering a word into a number field, Access will prompt you with an error stating so.
2. if you try to enter non-numeric characters into the SIN field of the Warner Cousins database, you will see the following appear:



- There may be an instance where it is necessary to have both letters and numbers in the same data field (such as the Phone field). Luckily, the Text data type allows you type in any characters you like.

Formatting A Table in Datasheet view

Access has always given you a great amount of flexibility when it comes to modifying the look and feel of the objects in your database. Access 2010 is no different, letting you modify just about everything you can think of.

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Format Font

- To format Font
MOUSE

| EmployeeID | SIN | First Name | Last Name |
|------------|-----------|------------|-----------|
| 1 | 123456789 | Bugs | Rabbit |
| 2 | 987654321 | Elmer | Funn |
| 4 | 987654111 | Daffy | Goose |
| 5 | | | |
| * | (New) | | |

1. If you create a new table and enter some data, the result is straightforward and clean:
2. The commands in the **TEXT FORMATTING** section of the **HOME** ribbon let you modify the font, font size, text style, orientation, gridlines, fill colour, and more, for the entire table. Any modifications you perform will be applied to the entire table.

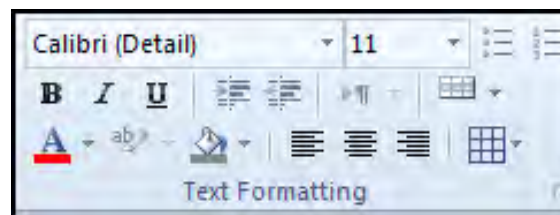
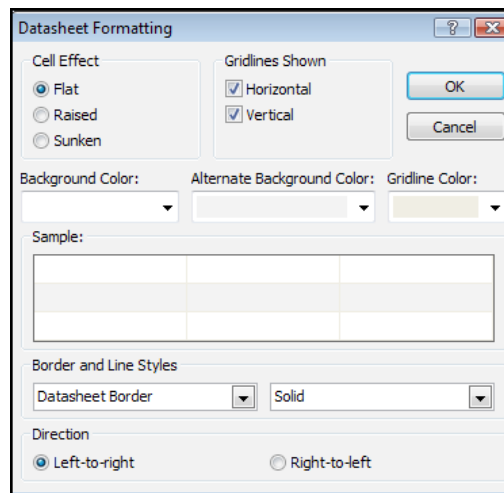


Table Format

If you have ever used Access before, chances are you noticed one of the new enhancements right away – the alternating background colours in the different rows of the table. You can modify the background colour by clicking the **TEXT FORMATTING** dialogue box launcher on the **HOME** ribbon:

► To change table appearance

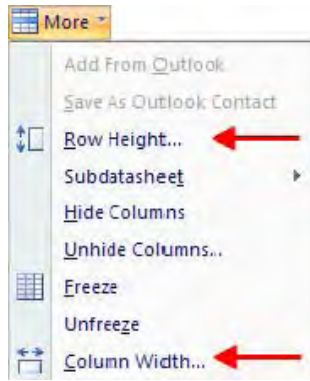
MOUSE



1. Click the **TEXT FORMATTING** dialog box launcher on the **HOME** ribbon
2. Change the **CELL EFFECT** from the options given
3. Change how you wish gridlines to be seen. Untick those you wish not to see.
4. Choose a **GRIDLINE COLOUR**.
5. Change the alternating colours for your table this makes it much easier to read your data.
6. Choose from the options given, from the drop down boxes, your border styles
7. Select a text direction
8. All options should show in the sample area of the dialogue
9. When all options have been made click **OK** to apply the changes or **CANCEL** to discard them.

Row Height / Column Width

Occasionally you may have very large (or very small) amounts of data to put into a table. For example, Access features a Memo data type that can hold a total of 65,535 characters – that's about 40 pages of solid text! You can expand the dimensions of rows and columns in order to be able to view the contents of a table.



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► To change row height/column width

MOUSE



1. To do this, click the **MORE** command in the **RECORDS** section of the **HOME** ribbon. In the drop down menu you will see entries for Row Height and Column Width:
2. With **ROW HEIGHT**, you can specify a unit of measurement or leave it at Standard height:
3. With **COLUMN WIDTH**, you can specify a unit of measurement for width or choose **BEST FIT**, which will automatically adjust the column to the width of the widest field's entry: ,



OR

You can also adjust the row height and column width manually.

1. Place your mouse on the lines dividing the rows and columns from each other. Your mouse will turn into a double-headed arrow

( for rows,  for columns).

2. Click and drag in the dimension displayed by the arrow to drag the height or width.

Working with records

About Records

So far we have come a long way in our exploration of Access. By now you should be comfortable with the basics of navigating the interface and the use of the Navigation Pane. We are now ready to explore the real stuff databases are made of, as well as begin to build one of our own.

What Is A Record?

We defined a record in Section 1 of this manual as a collected group of fields. More formally, a record is defined as one or more fields of data that create a single entry in a table. We have also learned that each record should have a primary key; that is, some unique identifier that sets it apart from every other record in a table.

Navigation Tips

Imagine you are working on this simple table in Datasheet view:

Before discussing how to move around inside a table, let's take a quick look at the features Access 2010 has automatically added. The ID field was automatically inserted to use as a primary key. Every table should have a primary key of some sort, but it is not necessary.

| ID | Field1 | Field2 | Add New Field |
|--------|--------|--------|---------------|
| 2 | North | 10 | |
| 3 | South | 20 | |
| 4 | East | 30 | |
| 5 | West | 40 | |
| *(New) | | | |






Field1 and Field2 are column headers that identify a column of data. The last field, Add New Field, is also an automatic placement by Access. This is not a column of data like the others, but can easily become one should you need it.

The field in the upper left-hand corner is currently highlighted in orange. To move the cursor to a different field you can use the mouse and click inside any other field. You can also use the arrow keys on your keyboard to move the selection to a different field.

Using the mouse and keyboard is fine for tables of data that can fit on your screen; however the majority of tables in databases are usually quite long. It becomes impractical to scroll up and down or press and hold the arrow keys to reach your destination. There is a small toolbar at the bottom of Datasheet view available to deal with this exact problem:



To browse through the various records, use the small arrow icons:

-  First Moves to the first record in the table.
-  Previous Moves to the previous record.
-  Next Moves to the next record.
-  Last Moves to the last record in the table.
-  New Creates a new record at the end of the table.

You can also apply a custom filter to the table by clicking the filter button. Access also lets you search for a particular entry by using the Search text box. Simply type in the keyword or number you are looking for and press Enter.

At the very bottom of the Access window, in the status bar on the right-hand side of the screen, you will see a few small icons. These icons denote which view you are currently using to work with the current object. In the diagram above, the available views of a table are listed (Datasheet view which is currently highlighted, and Design view).

Adding Records

There are a few different ways to create a new record. Try using all of them; depending on your level of experience with using computers you will likely find one that is easy for you to use.

The first method is likely the easiest if you are very comfortable using a keyboard. If you are entering data using the keyboard, enter the data you need into a field and press Enter on your keyboard. If you have reached the Add New Field column of data and press Enter again, you can now type in that column. Pressing Enter once more will bump the Add New Field down one column, and so on until you have added as many fields as you like to a record.

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► To add records

MOUSE OR KEYBOARD

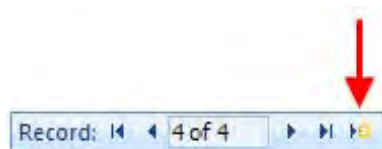
Method 1

1. If you are entering data using the keyboard, pressing **TAB** will also advance you to the next field in the row. However if you have reached the end of the record and press **TAB** again, you will move to a new record.

Method 2


1. Go to the the **HOME** ribbon. The **RECORDS** section of the ribbon contains a **NEW** record command (); click this to make a new record at the end of the table.

Method 3



1. Use the navigation bar located at the bottom of Datasheet view:
2. This will create a new record at the end of the table.

Editing Records

| | | | |
|---|---|-----------|----|
| | 8 | Southeast | 57 |
|  | 9 | Southweat | 58 |
| * | | (New) | |

If you made an error, or need to change the information in a record manually, simply open the table containing the data, scroll to or search for the data field you need to change, click inside the field and enter the new information. As you are entering data into a table, a small pencil icon will appear to the left of the record you are currently writing:

It is important to note that Access provides a little peace of mind by saving data automatically after every change to a data field. It is not necessary to manually save the database after every change. The only field you cannot modify in this way is the primary key. If there is some reason to modify the primary key, it is best to simply delete the record (described below) and make a new one with a new primary key.

► To edit a record

MOUSE

1. Click within the cell that contains the data you wish to change
2. Change the data
3. Click on the pencil icon or move out of the record to save the change.

Deleting Records

► To delete a record

MOUSE

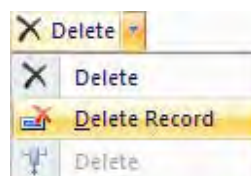
4. Consider the following table:

| Table1 | | | |
|--------|-----------|--------|---------------|
| ID | Field1 | Field2 | Add New Field |
| 2 | North | 10 | |
| 3 | South | 20 | |
| 4 | East | 30 | |
| 5 | West | 40 | |
| 6 | Northeast | 55 | |
| 7 | Northwest | 56 | |
| 8 | Southeast | 57 | |
| 9 | Southwest | 58 | |
| * | (New) | | |

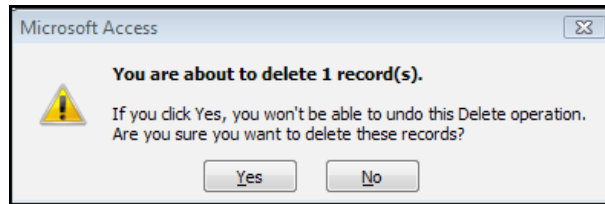
5. If you want to delete a single record, click any of the boxes to the left of a record. This will select the entire row of data:

| | | |
|---|-----------|----|
| 6 | Northeast | 55 |
| 7 | Northwest | 56 |
| 8 | Southeast | 57 |

6. Click the small pull down arrow beside the **DELETE** command in the Home ribbon and click **DELETE Record**:



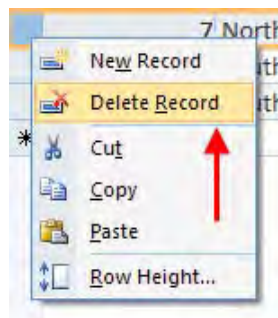
7. Access warns you that you are about to delete a record:



8. Click -YES- to confirm the deletion.

OR

1. Right-click the box to the left of the record and select **DELETE** Record from the drop down menu:



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Deleting records in this manner is fine for a few, but impractical if you need to purge a lot of data from a table. Luckily, Access allows you to delete multiple records at once. However, as a safety feature, you can only delete groups of adjacent records. That is, you can't merely pick and choose which records you want to delete and delete them all at once.

► To delete a group of records

MOUSE

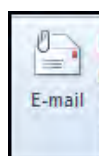
1. To select a group of records, click the box to the left of the first record you want to delete in order to highlight that row:

| | | | |
|---|---|-----------|----|
| | 5 | West | 40 |
| | 6 | Northeast | 55 |
| | 7 | Northwest | 56 |
| | 8 | Southeast | 57 |
| | 9 | Southwest | 58 |
| * | | (New) | |

2. While holding the **SHIFT** key down, click the box beside the last record you want to delete. This will highlight a block of records:
3. Now click the **DELETE** command on the **HOME** ribbon and click **DELETE Record**. You will be warned this operation cannot be undone; click **YES** to confirm the deletion.

If you prefer to use the right-mouse button, make sure you are still holding the **SHIFT** key and then right-click any of the boxes to the left of the selected records. Click **DELETE Record** and then **YES** to confirm the deletion.

E-Mailing Records



Access allows you to e-mail records from a table in many different file formats. To perform this operation,

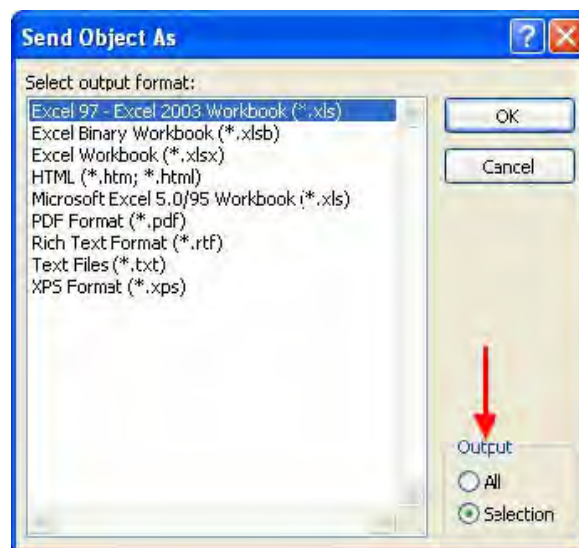
► To email records

MOUSE

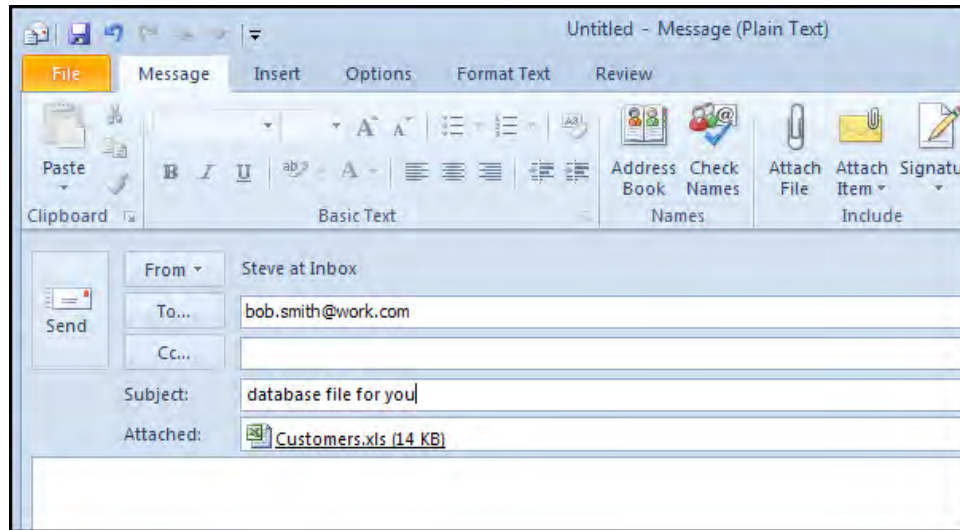
4. First select a record by clicking the box to the left of the record and highlighting the row, or hold the **SHIFT** key and then select a group of records.

| ID | Company | Last Name | First Name | E-mail Address | Job |
|----|-----------|----------------|------------|----------------|------------|
| 1 | Company A | Bedecs | Anna | | Owner |
| 2 | Company B | Gratacos Solso | Antonio | | Owner |
| 3 | Company C | Axen | Thomas | | Purchasing |
| 4 | Company D | Lee | Christina | | Purchasing |
| 5 | Company E | O'Donnell | Martin | | Owner |

5. For example, if you wanted to send records 2to 4 from the table above, first highlight all records:
6. Click on the **EXTERNAL DATA** Tab, the **EXPORT** group - **E-MAIL** button:
7. This will open the **SEND OBJECT AS** dialog box:



8. Here you can choose which type of file format you want Access to convert your data into before sending. If you are not sure which file format to use, selecting **PDF FORMAT** (if you have installed the add-in) or **TEXT FILES** will likely be your best option. These two file types can be read by virtually every computer platform. If the data is to be manipulated by the recipient an excel format will be a good choice as well.
9. Make sure the **SELECTION** radio button is selected in the **OUTPUT** section of the dialog box.
10. Click **OK**. This will open a new message in your default mail program (like Microsoft Outlook or Outlook Express) with a special attachment in the file format you have specified.
11. Enter the recipient's e-mail address and click **SEND**:
12. If you click the **-ALL-** radio button in the **SEND OBJECT AS** dialog box, Access will package the entire database object in the file format you specify and then attach it to a new e-mail message.



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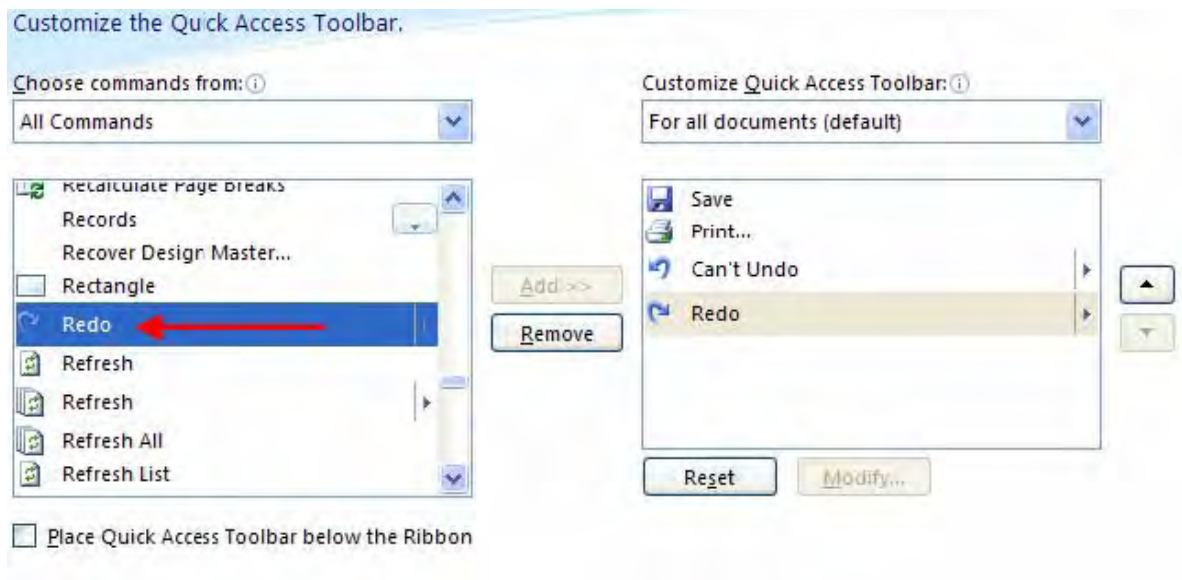
Using Undo And Redo

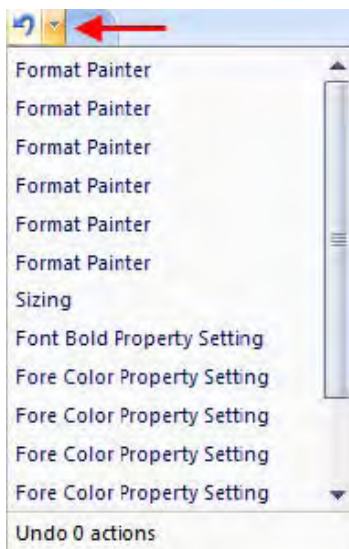
Undo and Redo are used as a way to recover or reinstate changes you have made to an object or file. Like Cut, Copy, and Paste, you can perform the Undo and Redo command in many different situations using Access (and many other programs). And like Cut, Copy, and Paste, Undo and Redo have their own keyboard shortcuts. (CTRL + Z and CTRL + Y respectively)



The Undo command is a standard control in the Quick Access toolbar:

The Redo command is used by pressing CTRL + Y or by adding the control to the Quick Access toolbar:





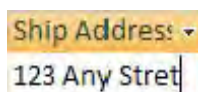
If you accidentally changed the font used in a control, use the Undo command to erase the changes and use the old font again. Access gives you the option to 'step back' through the last twenty operations you performed.

To see the operations that were performed before, click the small pull-down arrow beside the Undo or Redo command:

Pick the option in the list you want to -Undo-; Access will revert the actions in the reverse order in which they were performed.

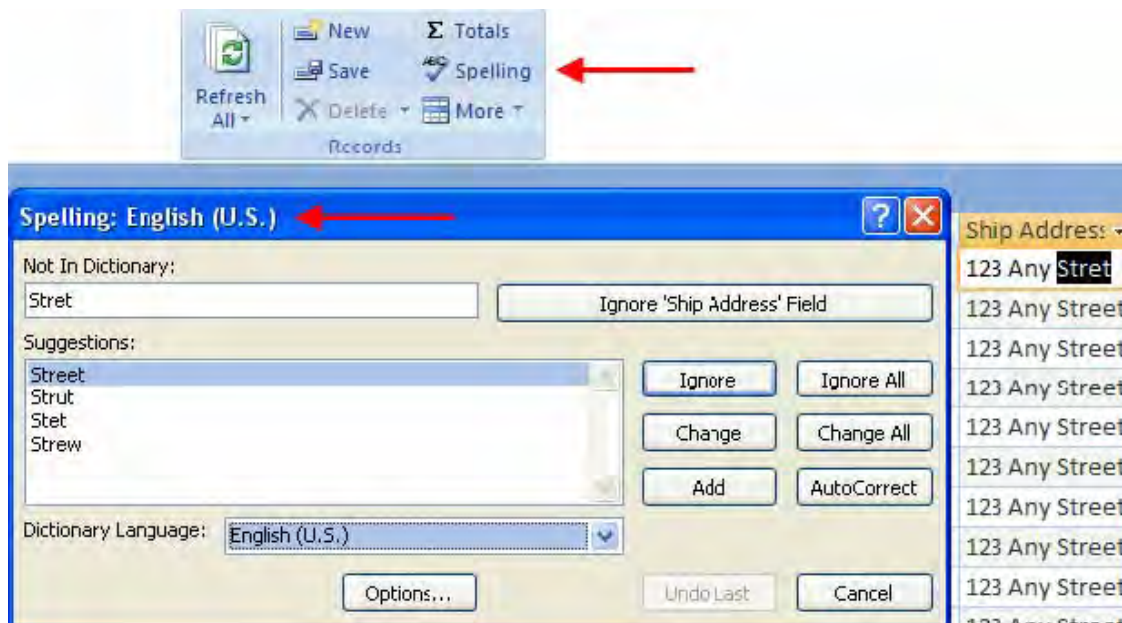
The only exception to the Undo and Redo command is one that involves the deletion of data. If you are not 100% sure that a certain piece of data can safely be removed, you should back up the database first. Should records be deleted because of an Undo or Redo command, their deletion cannot be reversed.

Checking Your Spelling



In the case of a database, you probably won't have too many spelling errors as most of the data is going to be in abbreviated form, in number form, or proper names that won't be in a dictionary. Nonetheless, Access lets you take advantage of a spell checker to check the records of a table for misspelled words. For example, if you misspelled the word Street:

Access' Check Spelling command will find and report an error like the one above if you activate the command in the **RECORDS** section of the **HOME** ribbon:



The Spelling dialogue box will appear with the word it couldn't find in the Not in Dictionary field. The dialogue box has several features to make spell checking easy. It offers possible spelling matches in the Suggestions list. You can also specify which language you would like the spell checker to use in the Dictionary Language combo box. (Be warned that changing dictionary languages may require the Office 2010 install media or a connection to the Internet to download a language package.)

The buttons on the right-hand side of the dialogue allow you to:

Ignore

Skip over this instance of the misspelled word.

Ignore All

Skip over all instances of this misspelled word.

Change

Change this misspelled word to the highlighted suggestion in the Suggestions box.

Change All

Change all instances of this misspelled word to the highlighted suggestion in the Suggestions box.

Add

Add this 'misspelled' word to the dictionary so any further instances will be considered correct.

AutoCorrect

AutoCorrect is a special function of the Microsoft Office Package that is designed to always change a misspelled word to the first suggestion. For example, if you had to type 'Street' many times for different addresses but you always forget to add the extra 'e', Access will automatically correct every instance of 'Stret' to 'Street'.

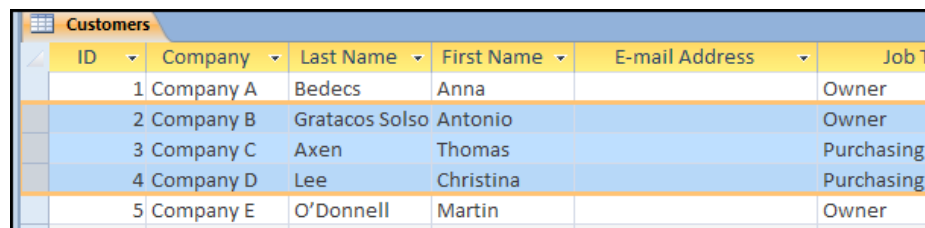
Printing Records

Office gives you the ability to print a selection of records.

► To Print records

MOUSE

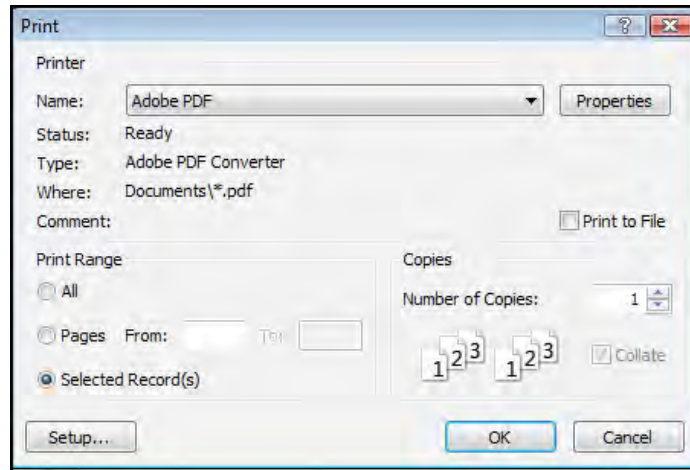
1. First, highlight the record(s) you would like to print:



| ID | Company | Last Name | First Name | E-mail Address | Job |
|----|-----------|----------------|------------|----------------|------------|
| 1 | Company A | Bedecs | Anna | | Owner |
| 2 | Company B | Gratacos Solso | Antonio | | Owner |
| 3 | Company C | Axen | Thomas | | Purchasing |
| 4 | Company D | Lee | Christina | | Purchasing |
| 5 | Company E | O'Donnell | Martin | | Owner |

Click **FILE** Tab - **PRINT**: The Print window on the right gives three options

2. Click on the **PRINT** button in the main window to open up the **PRINT** dialogue.



3. When the Print dialogue box appears, specify the **PRINT RANGE** you would like to use and the number of copies:
4. Select the printer if necessary.
5. Click **OK** to print the records. You can also select to print the entire object or only certain pages of the object; we will cover more advanced print topics later in this manual.

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Sorting and Finding Data In a table

The databases we have been dealing with so far haven't been very large. Most of the information available we could scroll through in a few minutes. But if you are managing a library or government database, you might spend your entire day looking through just one table and still not make it through.

Filters are like small specialized queries that are performed on a single table of information. Fortunately, Access has the ability to sort and filter data in order to narrow down the results you need. In this lesson we will explore how to sort and filter data in your database.

Using Find

If you are familiar with word processing and spreadsheet programs, you are probably familiar with **FIND AND REPLACE** commands. Even Internet browsers feature a find command. These commands are designed to search a document of any size quickly to find instances of a certain keyword or value and, if applicable, modify it.

You can use the **FIND AND REPLACE** commands on every database object except:

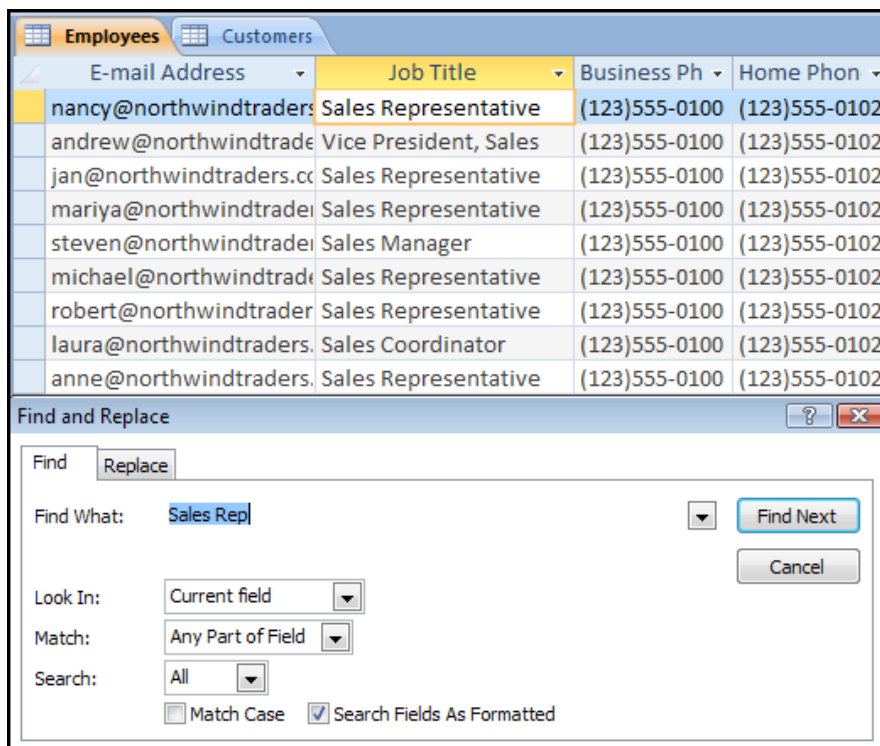
REPORTS- Which are really just documents to be printed.

MACROS- A collection of commands, no actual data.

MODULES- Another sequence of commands, again no actual data.

You can find both commands **FIND AND REPLACE** on the **HOME** ribbon.

The **FIND** command will search through an object and locate all instances of a keyword. The **FIND** command also gives you the ability to search only specific columns of data and flexibility in how it searches. If you only know part of a word or phrase, you can search based on what you know.



Find What

The **FIND WHAT** field lets you type in a certain word, part of a word, or a number. The keywords of any previous searches you have performed will appear if you click the pull-down arrow.

Look In

The **LOOK IN** field lets you search Field you are currently in, in the table or the entire current database object.

Match

If you are not 100% sure what you are looking for but at least have an idea, you can use different options in the **MATCH** field.

Search

The **SEARCH** field lets you conduct your search up, down, or all over the current object. For example, if you are looking for a particular name that starts with ‘T’ in a very large database, you can save a lot of search time by searching at the fields that start with T instead of the whole alphabet.

Match Case

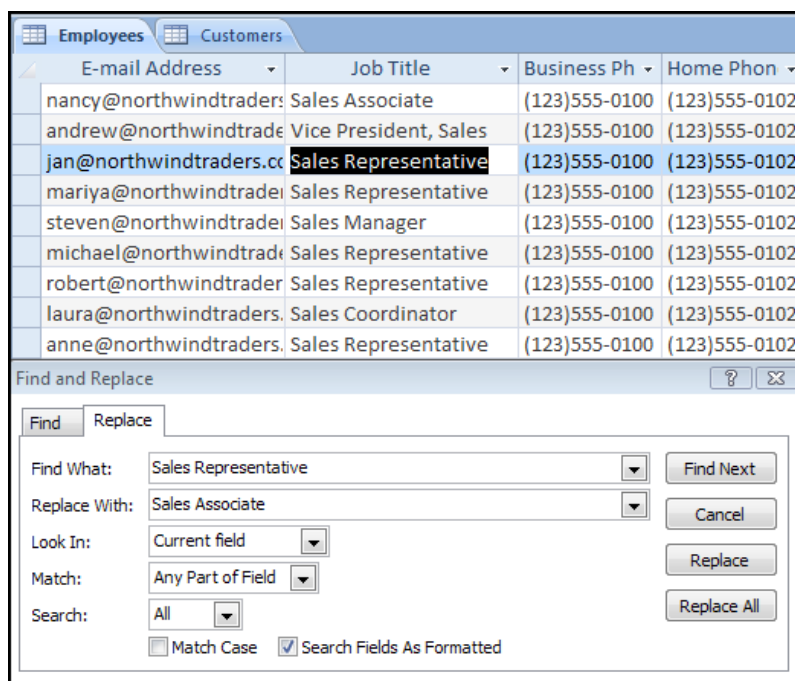
If you are looking for a certain organization name or something that is in all uppercase letter, you can have Access ignore all lower case entries in its search which can increase the accuracy and speed of searching.

Search Fields as Formatted

Imagine you want to search for a record containing a particular date, and you type April 25, 2004. If this box is checked, Access will search for all formats of this date, like 04/25/2004, 04/25/04, 25/04/04, 2004/25/04 and so on. Searching with this box checked will slow down certain searches, but is more likely to find the data you need.

Using Replace

The **Replace** command is an extension of the **FIND** command. It includes all the functionality of **FIND** but lets you modify all matches it finds to something else:



Enter the new word or phrase you want to replace in the **REPLACE WITH** field of the dialogue box. The **REPLACE** button on the right-hand side of the window will find the next instance that matches the search criteria and replace it with the new word or phrase. The **REPLACE ALL** command automatically scans the entire object listed in the **LOOK IN** combo box and replaces every match with the new word or phrase.

Be cautious; if you perform the **REPLACE ALL** command, you cannot undo the operation. You will have to do another **FIND AND REPLACE** to change the fields back.

Sort Ascending Or Descending

When viewing a table or query results in Datasheet view, you might want to sort through the records by hand if you know what you are looking for. Access 2010 has a very quick way to sort through data listed in columns. Consider the Employees table:

| | Last Name | E-mail Address | Job Title |
|---|---------------|------------------------|-----------------------|
| + | Freehafer | nancy@northwindtrader | Sales Associate |
| + | Cencini | andrew@northwindtrad | Vice President, Sales |
| + | Kotas | jan@northwindtraders.c | Sales Representative |
| + | Sergienko | mariya@northwindtrade | Sales Representative |
| + | Thorpe | steven@northwindtrade | Sales Manager |
| + | Neipper | michael@northwindtrad | Sales Representative |
| + | Zare | robert@northwindtrader | Sales Representative |
| + | Giussani | laura@northwindtraders | Sales Coordinator |
| + | Hellung-Larse | anne@northwindtraders | Sales Representative |
| * | | | |

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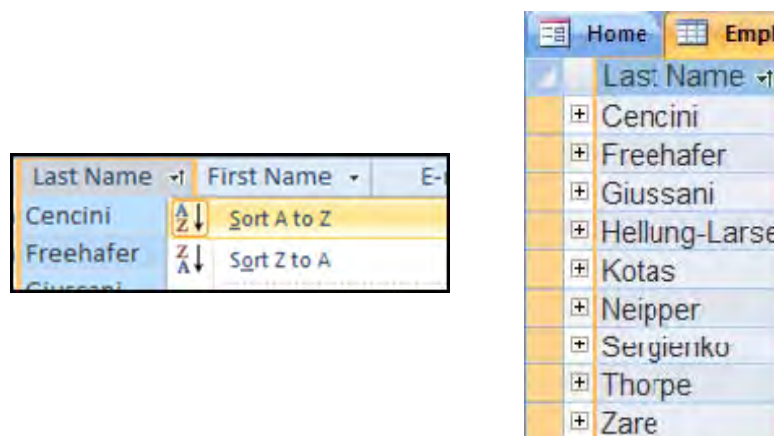
► To sort ascending descending

MOUSE

6. Click the column header (or headers) of the column(s) you wish to sort and then
7. Click either the **SORT ASCENDING** or **DESCENDING BUTTONS**: These commands can be found in the **SORT & FILTER** section of the **HOME** ribbon.

OR

8. Click on the drop down arrow to right of a column (field) name and select either the **SORT ASCENDING** or **DESCENDING BUTTONS** there.
9. The records in the table will sort themselves accordingly:



After applying a sort you may wish to change your mind

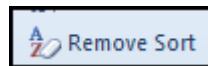
► To Remove a sort

MOUSE

1. You can sort by another column

OR

1. You may use the **REMOVE SORT** button in the sort and filter group



- We will look at more advanced sorts later in the manual

Filtering data in a table.

Toggle Filter

Access provides you with the ability to Filter and show records based on the values in a column of data.

E.G. if you wanted to show only the Sales Representatives,

► To apply different filters

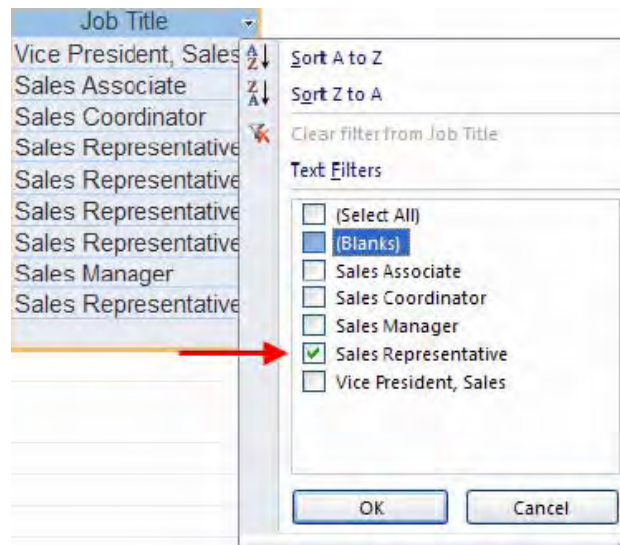
MOUSE

1. Click the column header of any column in Datasheet view.



2. Click the **FILTER** command in the **SORT & FILTER** section of the **HOME** ribbon:

OR



3. Click on the drop down arrow to right of a column (field) name
4. A drop down window will appear underneath the selected column header:
5. Click the Job Title column header to select the column
6. Show the drop down menu Uncheck all of the values listed in the drop down menu except for Sales Representative.
7. Then, click **OK** to toggle the filter. Only the Sales Representatives will be shown in the table:

| | Last Name | E-mail Address | Job Title |
|-------------------------------------|---------------|------------------------|----------------------|
| <input checked="" type="checkbox"/> | Hellung-Larse | anne@northwindtraders | Sales Representative |
| <input type="checkbox"/> | Kotas | jan@northwindtraders.c | Sales Representative |
| <input type="checkbox"/> | Neipper | michael@northwindtrad | Sales Representative |
| <input type="checkbox"/> | Sergienko | mariya@northwindtrade | Sales Representative |
| <input type="checkbox"/> | Zare | robert@northwindtrader | Sales Representative |
| * | | | |

► To remove the toggle

MOUSE

1. Open the menu from the column header as previous
2. Tick the **SELECT ALL** box
3. Click **OK** the filter has been removed and all data is again visible

Using FilterBy Selection

Access makes it easy to filter a table of data quickly based on one criterion. For example, consider the Standard Cost column in the Products table of the Northwind sample database:

Try this...



The sequence 2, 4, 6, 8, 10, 12, 14, 16, ... is the sequence of even whole numbers. The 100th place in this sequence is the number...?

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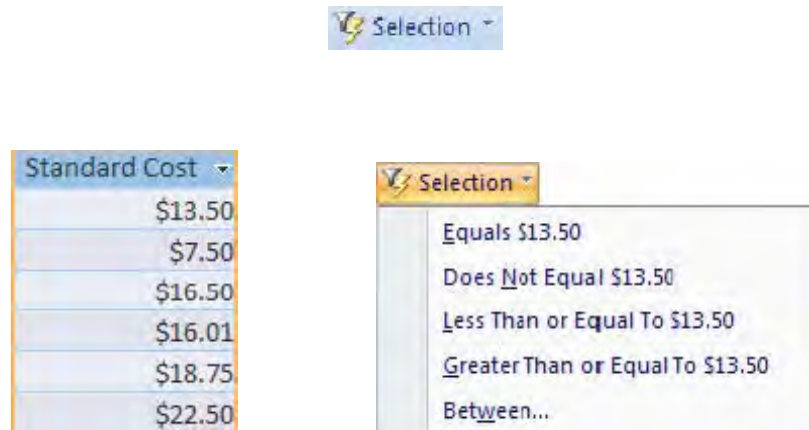
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► To use filter by selection

MOUSE

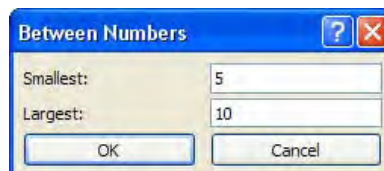
1. Click the first price in the list to highlight that particular field and then click the **SELECTION** command in the **SORT & FILTER** section of the **HOME** ribbon. A small drop down menu will appear:



2. Click any of the options to sort the table of data based upon the criteria in the menu. For example, if you click **LESS THAN OR EQUAL TO \$13.50**, the table will Filter and show the less expensive products.

| Supplier IDs | ID | Product Code | Product Name | Description | Standard Cost |
|--------------|----|--------------|--|-------------|---------------|
| Supplier D | 1 | NWTB-1 | Northwind Traders Chai | | \$13.50 |
| Supplier J | 3 | NWTCO-3 | Northwind Traders Syrup | | \$7.50 |
| Supplier A | 19 | NWTBGM-19 | Northwind Traders Chocolate Biscuits Mix | | \$6.90 |
| Supplier A | 21 | NWTBGM-21 | Northwind Traders Scones | | \$7.50 |
| Supplier D | 34 | NWTB-34 | Northwind Traders Beer | | \$10.50 |
| Supplier F | 41 | NWTSO-41 | Northwind Traders Clam Chowder | | \$7.24 |
| Supplier J | 48 | NWTCA-48 | Northwind Traders Chocolate | | \$9.56 |
| Supplier A | 52 | NWTG-52 | Northwind Traders Long Grain Rice | | \$5.25 |
| Supplier H | 66 | NWTS-66 | Northwind Traders Tomato Sauce | | \$12.75 |

3. The **BETWEEN** option in the **SELECTION** command displays the **BETWEEN NUMBERS** dialogue box. Enter the criteria for your search (between 5 and 10 for example) and click **OK**.



| | Supplier IDs | ID | Product Code | Product Name | Description | Standard Cost |
|---|------------------------|-------|--------------|--|-------------|---------------|
| + | Supplier J | 3 | NWTCO-3 | Northwind Traders Syrup | | \$7.50 |
| + | Supplier A | 19 | NWTBGM-19 | Northwind Traders Chocolate Biscuits Mix | | \$6.90 |
| + | Supplier A | 21 | NWTBGM-21 | Northwind Traders Scones | | \$7.50 |
| + | Supplier F | 41 | NWTSO-41 | Northwind Traders Clam Chowder | | \$7.24 |
| + | Supplier J | 48 | NWTCA-48 | Northwind Traders Chocolate | | \$9.56 |
| + | Supplier A | 52 | NWTG-52 | Northwind Traders Long Grain Rice | | \$5.25 |
| + | Supplier B, Supplier F | 74 | NWTDFN-74 | Northwind Traders Almonds | | \$7.50 |
| + | Supplier J | 77 | NWTCO-77 | Northwind Traders Mustard | | \$9.75 |
| + | Supplier A | 85 | NWTBGM-85 | Northwind Traders Brownie Mix | | \$9.00 |
| * | | ##### | | | | \$0.00 |

Using Advanced Filter Options

Access offers a few other advanced filtering options that are accessible by clicking the – **ADVANCED**- command in the **HOME** ribbon:

Filter by Form

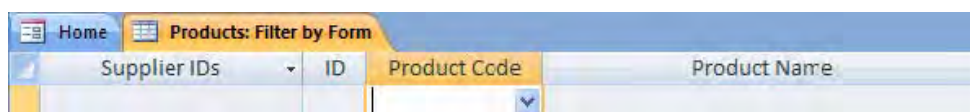
The Filter by Form command in Access is sort of like a small query. You can specify criteria that will be used to filter the data like a query, but its use is more limited. Using Filter by Form is fast and easy if you have only a single value you are looking for.

E.G.If you have a product ID but not a product name, Filter by Form can help.

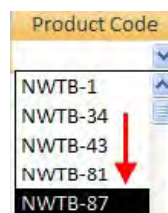
► To Filter by Form

mouse

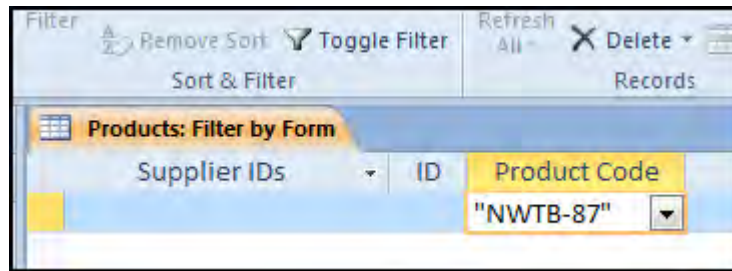
1. Open the Products table in Datasheet view and select **FILTER BY FORM**. Datasheet view will change to the following view:



2. Each column you click inside will show a combo box. Select one of the values in the combo box to add it to the **FILTER BY FORM** operation:



- When you have chosen the criteria you wish to filter, click the **TOGGLE FILTER** command in the ribbon.



- The corresponding record(s) will be displayed:

| Supplier IDs | ID | Product Code | Product Name |
|--------------|-------|--------------|-----------------------|
| | 87 | NWTB-87 | Northwind Traders Tea |
| | ##### | | |

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► To remove the filter

MOUSE

1. Click on the **TOGGLE FILTER** button once to remove the filter

The filter by form feature is available in forms and queries we will look at more advanced uses of this tool later after covering more criteria to allow us a broader scope for filtering our data.

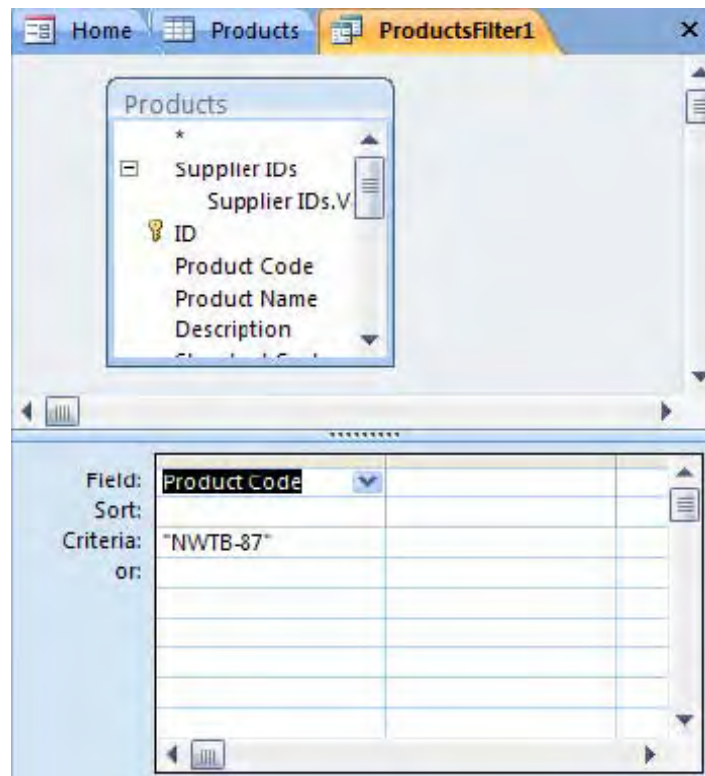
Advanced Filter/Sort

Access uses filters like small queries.

► To use advanced filter/sort

MOUSE

1. Clicking the **ADVANCED FILTER/SORT** command will open a view very similar to query **DESIGN** view:



2. Click and drag fields from the **PRODUCTS** list to the lower half of the window. You can apply sort criteria (Ascending, Descending) and enter search criteria such as a direct expression like the diagram above. You can also add any sort of criteria you like including logical expressions like greater than (>) and less than (<).
3. Once you have entered the criteria, click **TOGGLE FILTER** to show the results.

Other Advanced Commands

Clear all Filters

This command will remove any filters currently applied to a particular object.

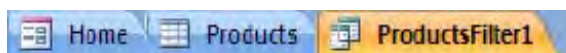
Load from Query

This command lets you load a filter from a query already stored in your database. Loading from a query is beyond the scope of this manual.

Save as Query

This command lets you save certain types of filters you perform as a query to use later on. Saving queries is beyond the scope of this manual.

Delete Tab



As you develop more filters for a particular table, you can use each one individually, like with an advanced sort for example:

Use the **DELETE TAB** command to remove the filters you no longer use.

Clear Grid

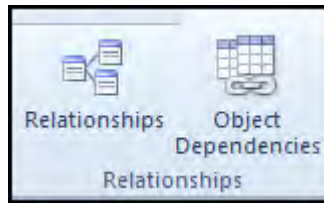
If you are performing a Filter by Form operation, use the Clear Grid command to reset all of the data columns back to their original empty state. If a particular Filter by Form operation is not giving you the results you wanted or expected, use this command to reset the form.

Changing Field Data Types

Access makes it very easy to change the data type of a certain field. Simply open the table containing the field you want to change and pick a new Data Type from the appropriate row. However, you must take care when modifying a data type in a table.

If the field is in a relationship with another table, or if the output of several forms and reports depend on the one field, changing the data type can be a major task. You should examine the dependencies of an object before making a change. Though we will explore table relationships more in this manual, relationships are one of the main characteristics of a database.

Object Dependencies



Picture a particular product listing in the Product table of a department store database. The item will contain a department number. The store database will contain another table called Departments. Let's say Department 1 is Women's Wear and Department 2 is Kitchen and Bath. Therefore, the two tables (Product and Department) are related because of common and related information (Department Number).

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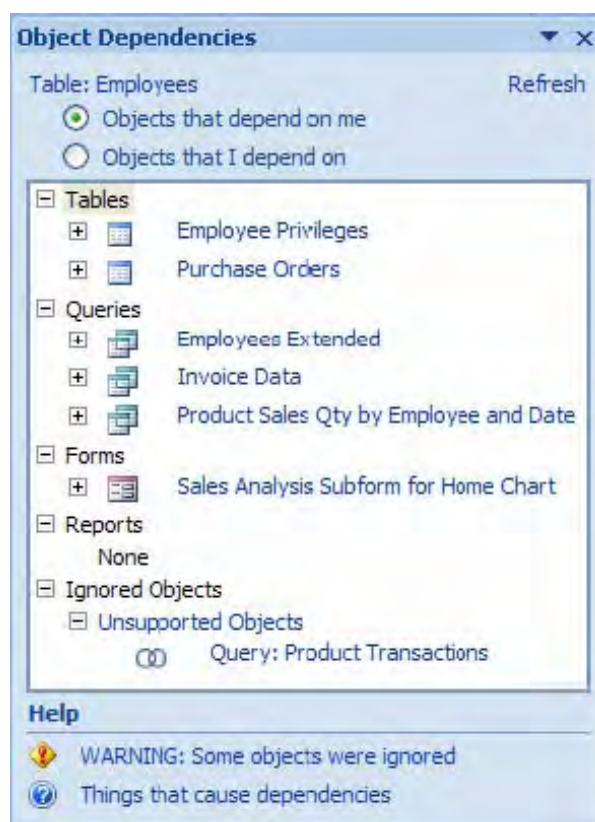
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► To examine object dependencies

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1. Open a database object from the Navigation pane.
2. Click the **OBJECT DEPENDENCIES** button in the **DATABASE TOOLS** ribbon to see this pane:

3. Objects that depend on a particular object and all objects that a particular object depends on are visible by selecting one of the two radio buttons at the top of the Object Dependencies pane.

Some tables may have many dependent objects. Modification of this table could end up being a long and tedious task. It might even be faster in some instances to scrap the particular table altogether and design a new one with the modified data type. If you feel you have to modify a data type, be careful and make sure it is absolutely necessary to do so. Remember that you can always make a backup copy of the data base and/or a copy of the object itself before you make any big changes, just to be safe.

Section 5 Queries

BY THE END OF THIS SECTION YOU WILL BE ABLE TO

- Understand the use of queries
- Use the query wizard
- Format text and controls
- Build Basic queries in Query design
- Apply basic criteria
- Multiple criteria
- Use “And” “Or” Criteria
- Build Calculations
- Parameter Queries
- Update Queries
- Make table queries
- Append queries
- Delete Queries

Creating Queries

We now have come far enough to get to the real functionality of a database: using a query. Having large amounts of data is fine, and having nice looking and well-designed forms is great, but if you can't pose a question to the database and find a result, there is not much use for a large list of data. In this lesson we will learn about queries and how they work.

What Is A Query?

A query is a question that is asked of a database control program about the data it contains. We specify what particular fields we are interested in finding out, tell the database where to look for those fields, and specify any conditions under which to search.

Queries are primarily built from tables, but Access gives you the ability to construct a query based on the results of another query. Such 'nested queries' may require more computer memory and resources in order to execute but if constructed with care, can save a lot of time, especially when dealing with very large databases. For the purposes of this manual, we will keep things simple and stick to small and simple queries. Plus, the great thing about queries is that they are only questions asked about data that is already there. If you get query results that are completely off the mark, no problem! The data is untouched, so provided there is no design flaw in your database, only the query needs to be adjusted.

We are assuming at this point having covered the previous sections that you have built a database with more than one table, set data types, descriptions, set field properties and primary keys then related the tables in a meaningful way and entered data into the tables.

Creating any object on a table will carry forward the field properties into the new objects if you build your database objects before setting your field properties on your table you will have tedious work in replicating the same properties to all objects. Ensure your tables are solid and all desired settings that you can set, have been.

Creating A Query With The Wizard

The query wizard is a quick way of creating a query and can help with certain types of query later on like unmatched queries or finding duplicates.



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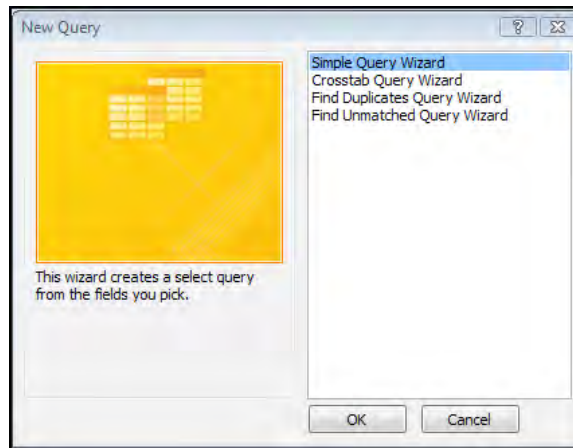


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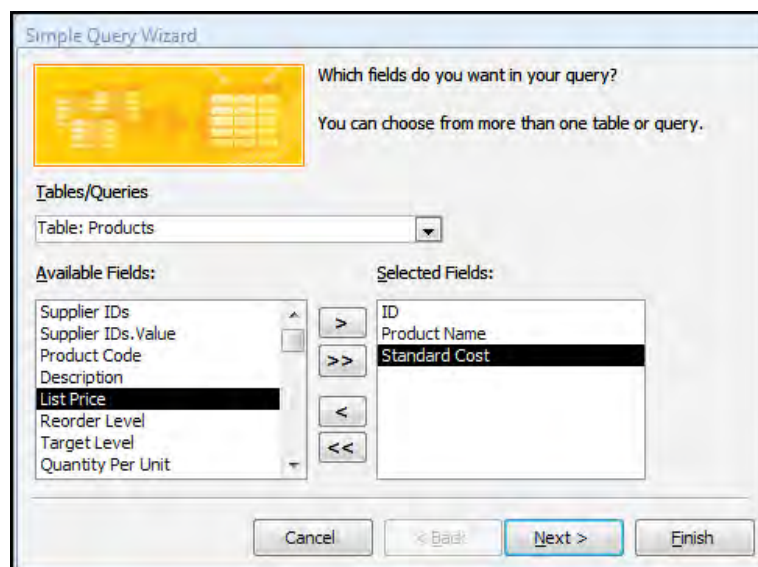
► To use the query wizard

MOUSE

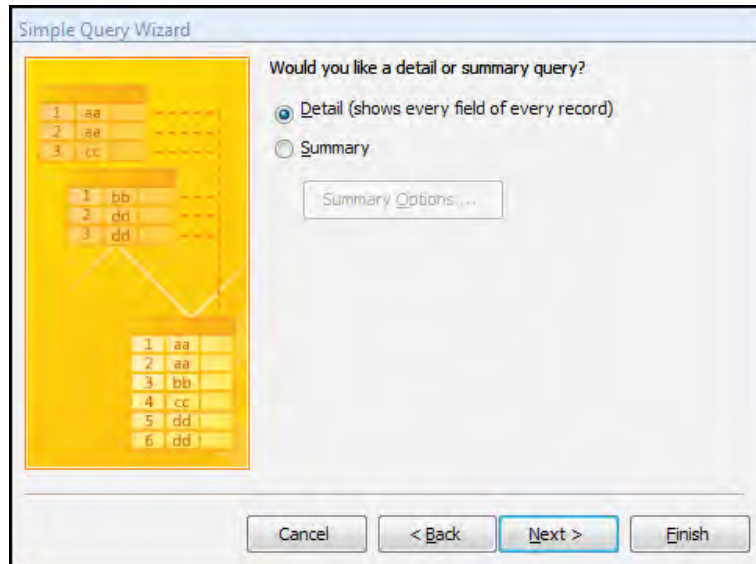
1. Click the **QUERY WIZARD** command in the Create ribbon:
2. The Wizard launches, allowing you to select which type of query to build:



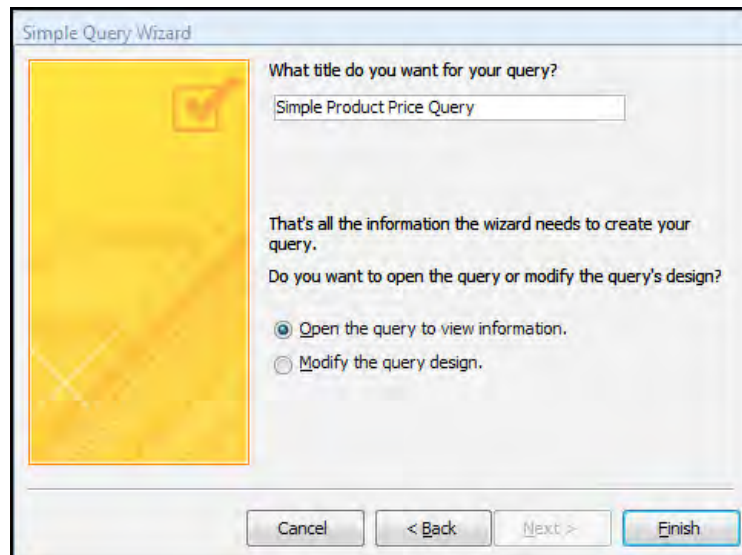
3. For the purposes of this manual, we will demonstrate a **SIMPLE QUERY** that will retrieve the product ID, product name, and price of every product in the Northwind sample database. This type of query is defined as a **SELECT** query, one that is used solely to retrieve information.
4. The next step of the Wizard is selecting which fields you want to use in your query.
5. In the **TABLES/QUERIES** combo box, select **TABLE: PRODUCTS**. Highlight **ID** and click the arrow (>) to move the field to the **SELECTED FIELDS** list.
6. Repeat for **PRODUCT NAME** and **STANDARD COST**:



- The next page of the Wizard gives you the option to apply a few summary calculations to the field like the maximum value, minimum value, and the average. However, we want to see all products, so leave the **DETAIL** radio button selected:



- The final page of the Wizard lets you name the query. You have the option to open the query right away or modify the design in Design view:



- Click **FINISH** to view the results of the query:



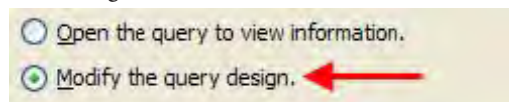
| ID | Product Name | Standard Cost |
|----|--|---------------|
| 1 | Northwind Traders Chai | \$13.50 |
| 3 | Northwind Traders Syrup | \$7.50 |
| 4 | Northwind Traders Cajun Seasoning | \$16.50 |
| 5 | Northwind Traders Olive Oil | \$16.01 |
| 6 | Northwind Traders Boysenberry Spread | \$18.75 |
| 7 | Northwind Traders Dried Pears | \$22.50 |
| 8 | Northwind Traders Curry Sauce | \$30.00 |
| 14 | Northwind Traders Walnuts | \$17.44 |
| 17 | Northwind Traders Fruit Cocktail | \$29.25 |
| 19 | Northwind Traders Chocolate Biscuits Mix | \$6.90 |
| 20 | Northwind Traders Marmalade | \$60.75 |
| 21 | Northwind Traders Scones | \$7.50 |

As you can see by the diagram, the query results are shown in what is essentially Datasheet view. The result of a query is essentially a table complete with its own rows. you can actually use the results of a query to construct a table.(see make table query later in this manual)

Using Query Design View To Modify a Query

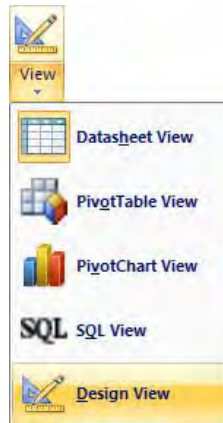
As you gain more proficiency with Access, you will reach a point where using just the Query Wizard will not be sufficient to get the results you are looking for. Therefore, you can use query Design view to modify any attribute of a query you like.

- To access **DESIGN** view after using a wizard, select the “**MODIFY THE QUERY**” design radio button:

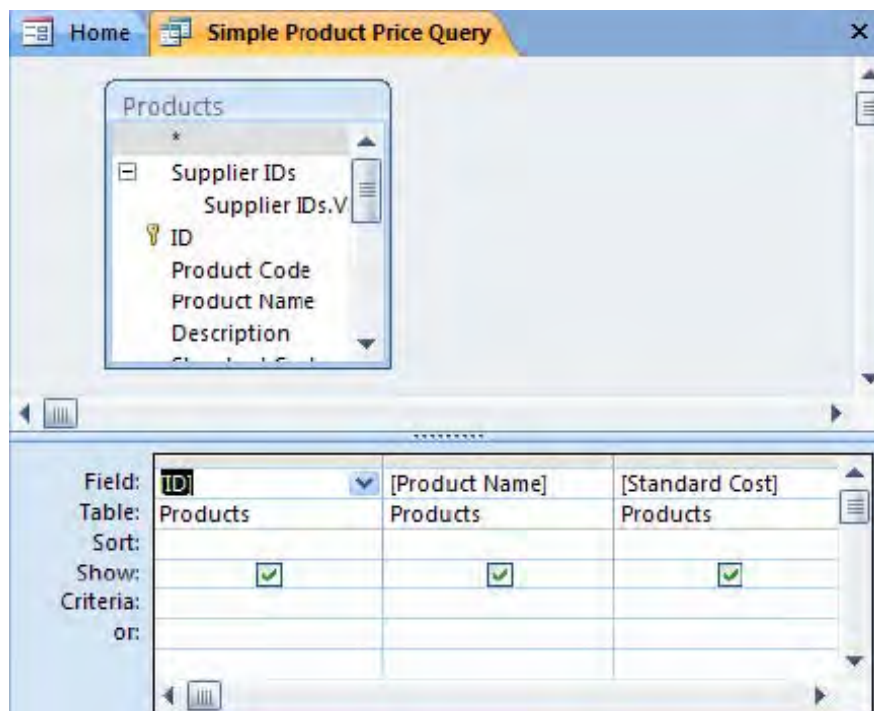


OR

- If you wish to modify a query that already exists, double-click the query object in the Navigation Pane to open it in Datasheet view.



3. Use the **VIEW** menu to select query **DESIGN** view:
4. Either way, you will be shown the following view:



5. The table or tables that were used in the query are present at the top of the window, while the various attributes that were specified during the design of a query are listed at the bottom. Note that the primary key is shown in the table as a small key icon. You will also see six different row listings at the bottom of the window.
 - The **FIELD** row will let you see all of the fields that are available for use in the query (in this case the attributes of the Products table).
 - The second row down is the **TABLE** row, where you can specify which table you want to use fields from.

- The **Sort** row lets you sort the results of the query in ascending or descending order (or no order at all, but rather the order in which the query happened to find data first).
 - The **Show** checkbox will determine if the field will actually be shown in the query results. (If an item is present in a query but does not have the Show checkbox marked off, it will still be considered in the query but the data that was used to satisfy the query will not be shown.)
 - The **Criteria** row lets you enter a logical operator and a condition that any displayed data must satisfy.
6. We have seen the results of finding all products in the Products table. If we want to show only the items that are more than \$50 To purchase, we can enter the criteria '>50.' This expression contains a logical operator (greater than).
- OTHER OPERATORS INCLUDE LESS THAN (<), EQUAL TO (=), AND NOT (!).**

Query Design view also contains its own contextual tab. let's take a quick look at what each section of commands does:

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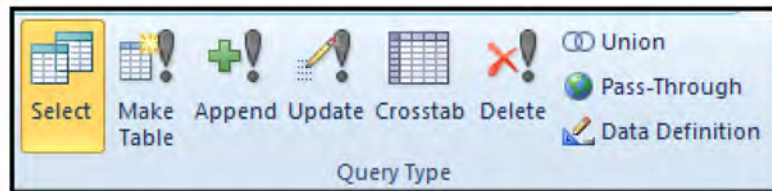
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Results



The Results section of the query Design ribbon lets you switch between views using the View menu and execute the query.

Query Type



This section of the ribbon allows you to modify properties of the query itself. Use these commands to make action queries that will perform some operation on the data in your database.

Query Setup



Use these commands to modify attributes of a query as well as construct more elaborate search criteria.

Show/Hide



The Show/Hide commands are used to view and modify different background attributes about the query and the data it will display.

Using Queries

To execute a query, you simply have to double-click the query name in the Navigation Pane. The results will be displayed in a new tab in Datasheet view. Since a query is not a bound object, you can delete a query without fear of deleting any data in your tables. But be careful if you do delete a query, because there might be another query, form, or report that uses the query to retrieve data for display to a user. If you eliminate the source query, the dependent object will not function properly.

Basic Query use.

In the last section of this manual we will deal with queries. Queries are really the second most important objects in a database (next to tables) because they have the ability to find information for you, Calculate and act as saved filters.

Review Of Queries

As a quick review, a query is a question that is asked of the data in a database. Although they are a structured piece of computer code, they are no more difficult than merely asking a question like, “How much did salesperson X sell in seafood products last year?” Queries primarily get their data from tables; however, a query can extract information from another query as well.

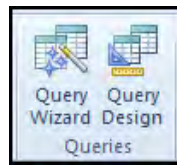
Basic queries are called select queries; they search for information in your database based on criteria you specify. There is another category of query called an action query that is designed to insert new data into a new table, delete old data from a table, or append to data already in a database based on criteria.

Create a Query in Design View

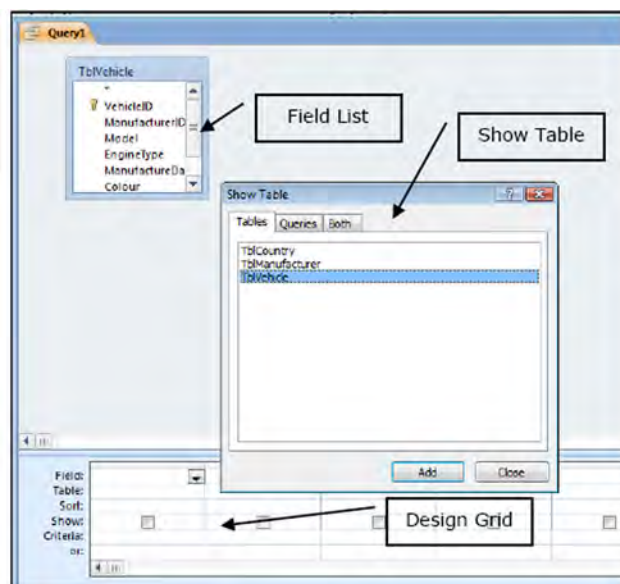
Creating a Query from scratch is much the best way to create queries (apart from writing SQL) in Access and once you have mastered the criteria and other aspects of queries you will probably find it quicker and more functional than using the wizard.

► To create a query using Design view.

MOUSE

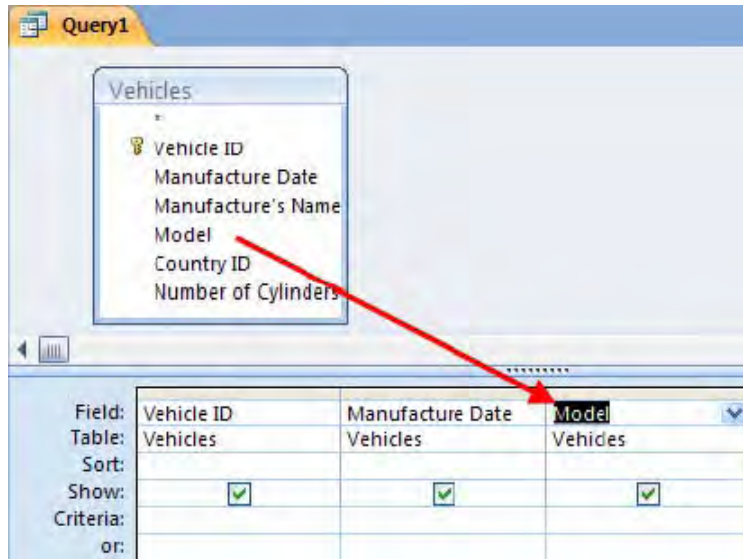


1. To start working with a new blank query, click the **QUERY DESIGN** command: on the **CREATE** ribbon.
2. Query **DESIGN** view will open with the **SHOW TABLE** dialog box.
3. Using this box, add as many tables and/or queries as you need to get the information relevant to your query. Select each necessary object and click **ADD**.



The source table will be added to the working space, with each field in the table listed. The primary key of the table contains a small key icon beside it. When you have finished adding the objects relevant to your table, click **-CLOSE-**.

4. To add fields to your query, simply click and drag the fields from the tables to the areas provided in The design grid:



OR

5. Double click the field in the table box you wish to add to the design grid and it will appear there.

OR

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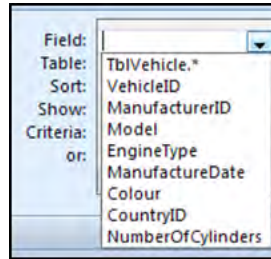
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- In the empty field box of the design grid use the combo box to select the field you wish to have there.

Selecting the **TblVehicle.*** will output all fields to the query when you run it however you will be unable to add meaningful criteria to a specific field. The same is said if you use the “*” option from the field list above.



- You also have the ability to add certain search criteria, choose whether a field will be shown in the query results, add additional search criteria, and more. We will explore more of Design view’s functionality later in this section.
- To execute the query, click the **RUN** command in the **RESULTS** section of the **QUERY TOOLS - DESIGN** ribbon:



- The results will be displayed in **DATASHEET** view:

| Vehicle ID # | Manufacture Date | Model |
|--------------|------------------|---------------|
| 1 | 1982 | Corvette |
| 2 | 2003 | V12 Vanquish |
| 3 | 2000 | S2000 |
| 4 | 2003 | Tiburon |
| 5 | 2002 | 575 Marinello |
| 6 | 1979 | Spider |
| 7 | 1965 | Falcon |
| 8 | 2005 | GT |
| * (New) | | |

Sorting A Query

Once you have designed and executed a query, you will be shown results in Datasheet view. You can easily apply a sorting scheme to query results. Consider the following query that was used to create a basic list of the products that Northwind Traders sell:

| ID | Product Name | Standard Cost |
|----|--|---------------|
| | Northwind Traders Chai | \$13.50 |
| 3 | Northwind Traders Syrup | \$7.50 |
| 4 | Northwind Traders Cajun Seasoning | \$16.50 |
| 5 | Northwind Traders Olive Oil | \$16.01 |
| 6 | Northwind Traders Boysenberry Spread | \$18.75 |
| 7 | Northwind Traders Dried Pears | \$22.50 |
| 8 | Northwind Traders Curry Sauce | \$30.00 |
| 14 | Northwind Traders Walnuts | \$17.44 |
| 17 | Northwind Traders Fruit Cocktail | \$29.25 |
| 19 | Northwind Traders Chocolate Biscuits Mix | \$6.90 |
| 20 | Northwind Traders Marmalade | \$60.75 |

► To sort a query

MOUSE

1. Select a column of data by clicking on the name of the column (such as Product Name column header). You can use the **SORT & FILTER** section of the **HOME** ribbon and click either the **SORT ASCENDING** or **SORT DESCENDING** commands as we did for a table.



2. The data in the column and the respective row will sort itself, for example, in Ascending or descending order:

| ID | Product Name | Standard Cost |
|----|--------------------------------------|---------------|
| 74 | Northwind Traders Almonds | \$7.50 |
| 34 | Northwind Traders Beer | \$10.50 |
| 6 | Northwind Traders Boysenberry Spread | \$18.75 |
| 85 | Northwind Traders Brownie Mix | \$9.00 |
| 4 | Northwind Traders Cajun Seasoning | \$16.50 |
| 86 | Northwind Traders Cake Mix | \$10.50 |
| 1 | Northwind Traders Chai | \$13.50 |
| 91 | Northwind Traders Cherry Pie Filling | \$0.00 |
| 99 | Northwind Traders Chicken Soup | \$0.00 |
| 48 | Northwind Traders Chocolate | \$9.56 |

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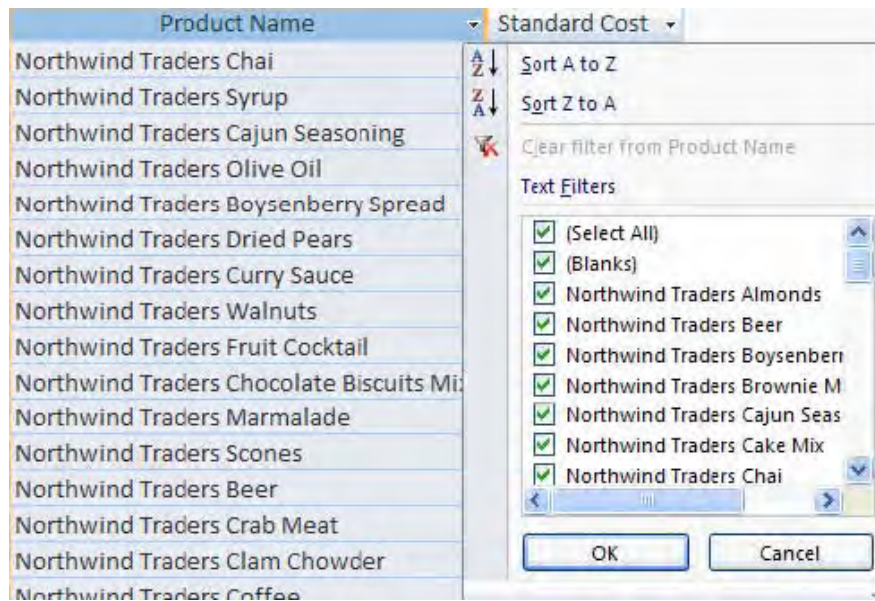
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3. Notice that a very small 'up' arrow is visible on the far right-hand end of the header. The second method of sorting the data involves using the column header itself. Click the small pull-down arrow on the right-hand side of the column header:

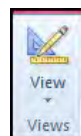


4. This pull-down menu provides much of the functionality that the **SORT & FILTER** section provides. Simply click the type of sort you want to apply. Access also gives you the ability to sort multiple columns of data at a time.

► To select multiple columns

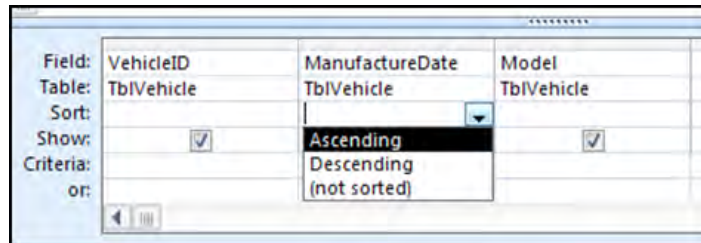
MOUSE

1. Select a single column as above.
2. Press and hold the Shift key, and click the column headers of any adjacent column.
3. Click the type of sort you want to apply from the options provided



OR

1. Return to design view using the **DESIGN VIEW** button on the ribbon.
2. In the **SORT** section of the **DESIGN GRID** choose from the combo either ascending or descending under the field of your choice



3. Run the query

Filtering a Query

Applying a filter to a query is a bit like querying a query, where you apply extra criteria to search results in order to narrow down the results you need (or find that the query does not give you the results you thought you were going to get). The filtering options are much the same as when we were filtering a table.

There are a few different ways to filter a query, so let's talk about each.

Filter By Selection

Filtering by Selection is one of the easiest methods of filtering. Filter by Selection lets you select any field that was returned by a query and filtering the query results based on that one field. For example, consider the following product query that has already been filtered in alphabetical order:

| ID | Product Name | Standard Cost |
|----|--|---------------|
| 74 | Northwind Traders Almonds | \$7.50 |
| 34 | Northwind Traders Beer | \$10.50 |
| 6 | Northwind Traders Boysenberry Spread | \$18.75 |
| 85 | Northwind Traders Brownie Mix | \$9.00 |
| 4 | Northwind Traders Cajun Seasoning | \$16.50 |
| 86 | Northwind Traders Cake Mix | \$10.50 |
| 1 | Northwind Traders Chai | \$13.50 |
| 91 | Northwind Traders Cherry Pie Filling | \$0.00 |
| 99 | Northwind Traders Chicken Soup | \$0.00 |
| 48 | Northwind Traders Chocolate | \$9.56 |
| 19 | Northwind Traders Chocolate Biscuits Mix | \$6.90 |
| 41 | Northwind Traders Clam Chowder | \$7.24 |
| 43 | Northwind Traders Coffee | \$34.50 |
| 93 | Northwind Traders Corn | \$0.00 |

Notice how a few of the records returned have a Standard Cost of \$0.00. If we want to find out how many other products have not had a price assigned to them yet,

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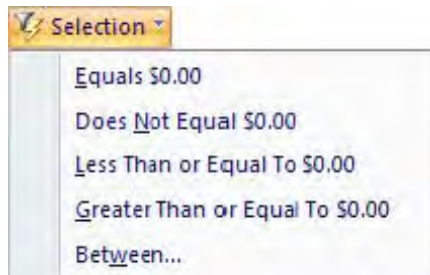


► To filter a Query
mouse

1. Click any instance of a \$0.00 price to select the cell.
2. Click the pull-down arrow beside the Selection command in the **SORT & FILTER** section:



3. The options listed in the pull-down menu allow you to apply logical filtering to the current selection. Since we wish to find all of the items with the same price, select the first option. This will display all items meeting the search criteria:

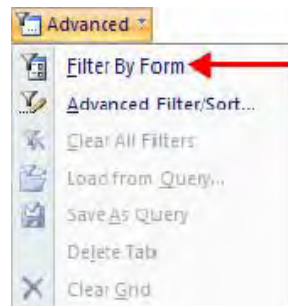


4. The results show in the picture on the next page.
5. To remove the filter click the **TOGGLE FILTER** button in the **SORT & FILTER** section of the ribbon

| ID | Product Name | Standard Cost |
|---------|--------------------------------------|---------------|
| 91 | Northwind Traders Cherry Pie Filling | \$0.00 |
| 99 | Northwind Traders Chicken Soup | \$0.00 |
| 93 | Northwind Traders Corn | \$0.00 |
| 82 | Northwind Traders Granola | \$0.00 |
| 92 | Northwind Traders Green Beans | \$0.00 |
| 97 | Northwind Traders Hot Cereal | \$0.00 |
| 89 | Northwind Traders Peaches | \$0.00 |
| 88 | Northwind Traders Pears | \$0.00 |
| 94 | Northwind Traders Peas | \$0.00 |
| 90 | Northwind Traders Pineapple | \$0.00 |
| 83 | Northwind Traders Potato Chips | \$0.00 |
| 96 | Northwind Traders Smoked Salmon | \$0.00 |
| 95 | Northwind Traders Tuna Fish | \$0.00 |
| 98 | Northwind Traders Vegetable Soup | \$0.00 |
| * ##### | | \$0.00 |

Filter By Form

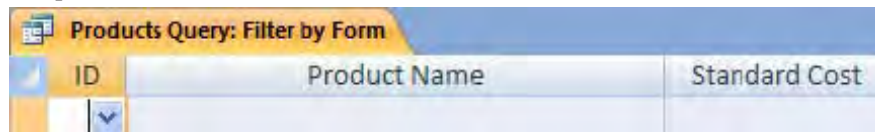
The next method of filtering is **FILTER BY FORM**. The filter by form is the same process as in tables



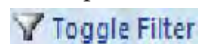
► To filter by form

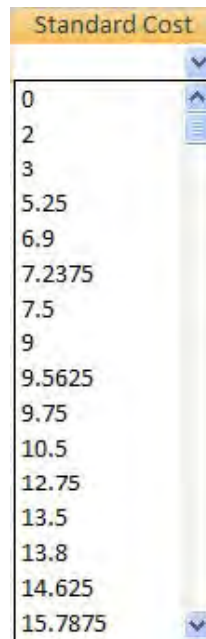
MOUSE

1. Click the **FILTER BY FORM** option found in the **ADVANCED** command in the **SORT & FILTER** section of the ribbon
2. Each column of data is replaced by a combo box, and each value in the combo box represents one instance of every unique value in the column of data.



3. For example, click the combo box in the **STANDARD COST** column:
4. Select one of the options in the list to only display the records which have the same standard cost as the value you selected from the combo box. Pick a price from the column, such as 7.5,





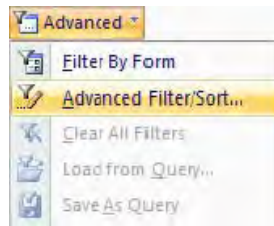
5. Click the **TOGGLE FILTER** command () in the **SORT & FILTER** section of the **HOME** ribbon:
6. The records show equally the filter conditions
7. Click the **TOGGLE FILTER** button a second time to remove the filter.

| Products Query | | |
|----------------|---------------------------|---------------|
| ID | Product Name | Standard Cost |
| 3 | Northwind Traders Syrup | \$7.50 |
| 21 | Northwind Traders Scones | \$7.50 |
| 74 | Northwind Traders Almonds | \$7.50 |
| * | ##### | \$0.00 |

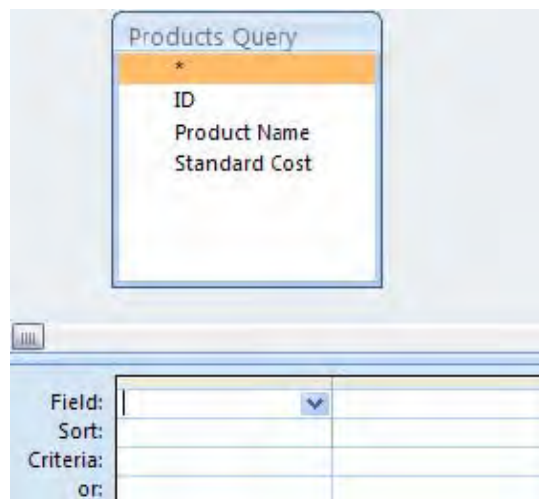
Advanced Filter

1. The final type of filter that Access can perform is an **Advanced Filter**; a manual filter using **DESIGN** view.

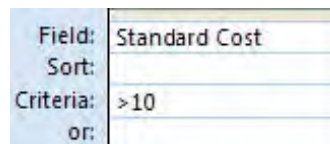
► To use an advanced filter.
MOUSE



1. click the **ADVANCED FILTER/SORT** option in the **ADVANCED** command:
2. It appears to be the design grid of a new query with the field list at the top and the design grid near the bottom.
3. To perform an advanced filter operation, drag and drop the fields you want to consider from the table listing to the design grid Field cells below as when you created a query.



4. Once you have added a field, you can specify how you want to sort the results (either ascending or descending)



5. Set the criteria you want to use to filter with. For example, if you want to find all products over \$10.00 in price, drag the Standard Cost field into the Field cell, and then enter **>10** into the Criteria cell:
6. Then, click the **TOGGLE FILTER** command to filter the results

| ID | Product Name | Standard Cost |
|---------|--------------------------------------|---------------|
| 1 | Northwind Traders Chai | \$13.50 |
| 4 | Northwind Traders Cajun Seasoning | \$16.50 |
| 5 | Northwind Traders Olive Oil | \$16.01 |
| 6 | Northwind Traders Boysenberry Spread | \$18.75 |
| 7 | Northwind Traders Dried Pears | \$22.50 |
| 8 | Northwind Traders Curry Sauce | \$30.00 |
| 14 | Northwind Traders Walnuts | \$17.44 |
| 17 | Northwind Traders Fruit Cocktail | \$29.25 |
| 20 | Northwind Traders Marmalade | \$60.75 |
| 34 | Northwind Traders Beer | \$10.50 |
| 40 | Northwind Traders Crab Meat | \$13.80 |
| 43 | Northwind Traders Coffee | \$34.50 |
| 51 | Northwind Traders Dried Apples | \$39.75 |
| 56 | Northwind Traders Gnocchi | \$28.50 |
| 57 | Northwind Traders Ravioli | \$14.63 |
| 65 | Northwind Traders Hot Pepper Sauce | \$15.79 |
| 66 | Northwind Traders Tomato Sauce | \$12.75 |
| 72 | Northwind Traders Mozzarella | \$26.10 |
| 86 | Northwind Traders Cake Mix | \$10.50 |
| * ##### | | \$0.00 |

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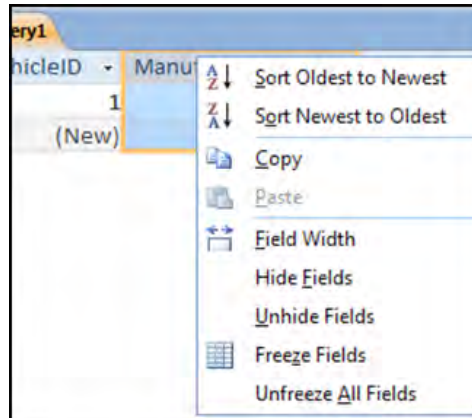
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Hiding Fields

Access gives you the ability to hide and show different columns of data that may be necessary for filtering to work properly, but are not necessary to see at all times.



► To hide a Field.

MOUSE

1. Right-click the column name and click **HIDE FIELDS**:

► To hide multiple Fields

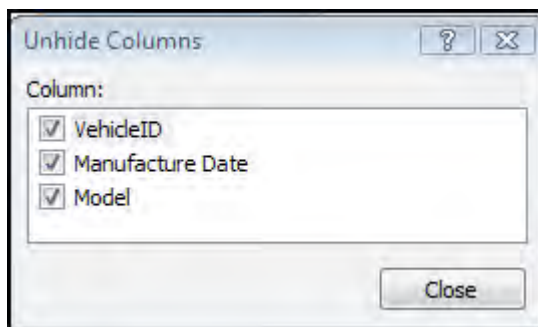
MOUSE

1. Click one column header to highlight it.
2. Press and hold the **SHIFT** key, then click other adjacent columns to select them.
3. Right-click on any of the columns and click **HIDE FIELDS** to make them disappear from view.

► To show any hidden Fields

MOUSE

1. Right click the header of any column still visible and click **UNHIDE FIELDS**:
2. The **UNHIDE COLUMNS** dialogue box will appear.



3. Any hidden Field or Fields are indicated by the absence of a checkmark.
4. Check or uncheck to show or hide Fields.

Filtering Using "AND"/"OR" Operators

If you recall the **FILTER BY FORM** section of this lesson, we went searching for all products costing \$7.50.

| ID | Product Name | Standard Cost |
|----|---------------------------|---------------|
| 3 | Northwind Traders Syrup | \$7.50 |
| 21 | Northwind Traders Scones | \$7.50 |
| 74 | Northwind Traders Almonds | \$7.50 |
| * | ##### | \$0.00 |

Before you entered the \$7.50 filter criteria, you might have noticed at the bottom of the Filter by Form window that there are two tabs active: **LOOK FOR** and **OR**. If we wanted to search for products that cost \$7.50 and products costing more than \$12.75 (or both), simply click the **OR** tab and enter more search criteria. As you add more **OR** searches, more **OR** tabs will appear to make your search as specific or vague as you require.

When dealing with **AND** and **OR** operations, it is important to understand how they work on a logical level. These operators require two pieces of input and produce one output, either true or false.

The **AND** operation is perhaps the easier to understand. Both conditions of **AND** must be satisfied in order to produce a true result. For example, if you are making a cake, you need to have wet and dry ingredients mixed together. If you have wet and no dry, or dry and no wet, or neither, you cannot make a cake.

The **OR** operation is true as long as one condition is true. Let's say you want to go and see a movie, but you will only go if you have at least one friend to go with. You ask Alice and Bob if they want to come. If Alice and Bob can both come, then you will go to the movies. If Alice can make it but Bob can't, you will go, and vice versa. If neither Alice nor Bob can go to the movies, you are not going to go either.

The best place to apply **AND/OR** operators directly is using Design view of a query (or query results). Let's take a look at the Design view for the simple products query we have been using:

| Field: | ID | Product Name | Standard Cost |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|
| Table: | Products | Products | Products |
| Sort: | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | | | =7.5 |
| or: | | | >12.75 |

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We would like to see the products that cost either \$7.50 or greater than \$12.75

To calculate this, specify the criteria in the **STANDARD COST** field of the Products Query:

Each successive condition you enter in the column is called a **WHERE** clause; you can add several **WHERE** clauses to help find more specific values. For example, if you own a company and lost the paper copy of an invoice, and you knew that the total was \$960, entering the =960 criteria will consider only those records that match. When designing queries or filtering criteria that use **AND** operations, you essentially add more fields to a query and give each one a specific criteria. For example, if you know that the missing invoice was \$960 and sold by Salesperson A; enter the exact criteria into Design view.

Should you not get the results you were looking for, don't resort to merely trying different criteria that don't make sense to your situation. Think it out and ask why it isn't working or giving you the results you thought you should be getting. Another option for troubleshooting queries is to clear all of the criteria in your query and add it back one condition at a time. Make sure that before adding another field, the results of the previous query are accurate for your purposes.

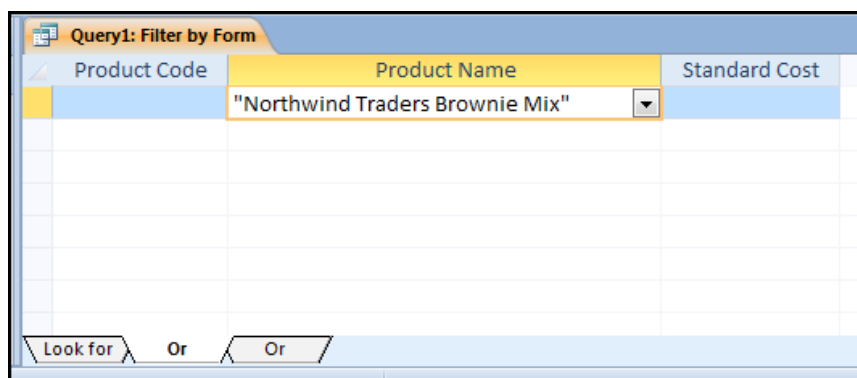
Using "OR" in filter by form

When you wish to find more than one value while filtering by form we do not need to type or we use the or tabs at the bottom of the screen.

► To use the OR operation in filter by form

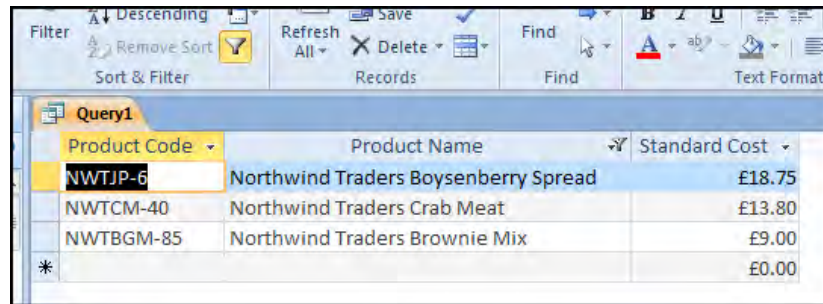
MOUSE

1. Open or create a query
2. From the **SORT & FILTER** section, **ADVANCED**, select **FILTER BY FORM**.
3. Select a value from the combo box of the field you wish to filter by
4. At the bottom of the screen click on the **OR** tab a new **OR** tab will appear and this screen will appear empty of criteria.



5. Select another value from the drop down combo from the field you require.

6. If you have several values you wish to filter for keep clicking the **OR** tab and selecting a new value each time.



| Product Code | Product Name | Standard Cost |
|--------------|--------------------------------------|---------------|
| NWTJP-6 | Northwind Traders Boysenberry Spread | £18.75 |
| NWTTCM-40 | Northwind Traders Crab Meat | £13.80 |
| NWTBGM-85 | Northwind Traders Brownie Mix | £9.00 |
| * | | £0.00 |

Click the **TOGGLE FILTER** button to view your results

7. Click the **TOGGLE FILTER** button again to remove the filter

Using "AND" in filter by form

Using and in a filter by form operation is a similar operation to previous except this time we want the results to meet more than one condition at the same time

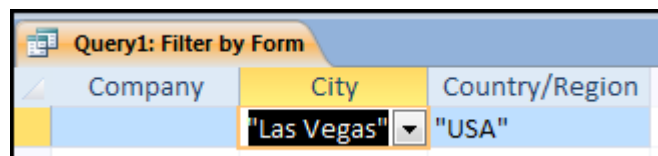
OR means meeting one of the conditions.

AND means meeting ALL the conditions.

► To use the AND operation in filter by form

MOUSE

1. Open or create a query
2. From the **SORT & FILTER** section, **ADVANCED**, select **FILTER BY FORM**.
3. Select a value or enter a criteria from the combo box of the field you wish to filter by
4. In another field choose another criteria



5. In the example shown the companies will have to be from the USA **AND** from Las Vegas
6. Click the **TOGGLE FILTER** button to view your results

| Company | City | Country/Region |
|------------|-----------|----------------|
| Company AA | Las Vegas | USA |
| Company L | Las Vegas | USA |

7. Click the TOGGLE FILTER button again to remove the filter

Select Queries and criteria

We have dabbled so far with creating basic queries and tested the use of filtering upon the data that is revealed but the real use of queries are the saved advanced filters if you like because these saved filters (queries) can be used over again as our data changes to show new records as the data evolves also since we will be learning to calculate within our queries we will be able to do so much more than using a filter. Later we will be building forms and reports based on the data returned from these queries so the construction of these queries is important.

Create A Select Query With Single Criteria

To start you off slowly we will create a select query in design view and use a single criterion to filter out data. We will then save that query. We will use the Northwind database


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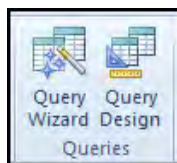
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► To create a query

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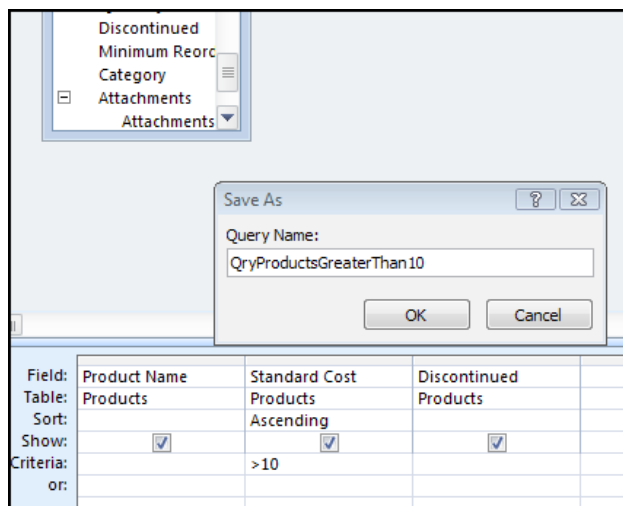
1. Create a query in design view (by clicking on the **QUERY DESIGN** button on the create ribbon)
2. Add the **PRODUCTS** table by selecting it and clicking **ADD**

OR

1. Double click on the **PRODUCT** table
2. Click **CLOSE** to close the **SHOW TABLE** dialogue

| Field: | Product Name | Standard Cost | Discontinued | |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|--|
| Table: | Products | Products | Products | |
| Sort: | | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Criteria: | | | | |
| or: | | | | |
| | | | | |
| | | | | |

3. Add the fields **PRODUCT NAME**, **STANDARD COST** and **DISCONTINUED** to the design grid using one of the methods previously discussed.



4. In the criteria row under **STANDARD COST** enter the criteria **>10**
5. Sort the **STANDARD COST** field **ASCENDING** from the **SORT** Row.
6. Click on the **SAVE** button (**QUICK ACCESS** toolbar)
7. Enter the name:
8. QryProductsGreaterThan10
9. Click **OK** to close the dialogue
10. Run the Query
11. Data should appear as on the next page.
12. Close the query window.

| QryProductsGreaterThan10 | | |
|--------------------------------------|---------------|--------------------------|
| Product Name | Standard Cost | Discontinue |
| Northwind Traders Beer | £10.50 | <input type="checkbox"/> |
| Northwind Traders Cake Mix | £10.50 | <input type="checkbox"/> |
| Northwind Traders Tomato Sauce | £12.75 | <input type="checkbox"/> |
| Northwind Traders Chai | £13.50 | <input type="checkbox"/> |
| Northwind Traders Crab Meat | £13.80 | <input type="checkbox"/> |
| Northwind Traders Ravioli | £14.63 | <input type="checkbox"/> |
| Northwind Traders Hot Pepper Sauce | £15.79 | <input type="checkbox"/> |
| Northwind Traders Olive Oil | £16.01 | <input type="checkbox"/> |
| Northwind Traders Cajun Seasoning | £16.50 | <input type="checkbox"/> |
| Northwind Traders Walnuts | £17.44 | <input type="checkbox"/> |
| Northwind Traders Boysenberry Spread | £18.75 | <input type="checkbox"/> |
| Northwind Traders Dried Pears | £22.50 | <input type="checkbox"/> |
| Northwind Traders Mozzarella | £26.10 | <input type="checkbox"/> |
| Northwind Traders Gnocchi | £28.50 | <input type="checkbox"/> |
| Northwind Traders Fruit Cocktail | £29.25 | <input type="checkbox"/> |
| Northwind Traders Curry Sauce | £30.00 | <input type="checkbox"/> |
| Northwind Traders Coffee | £34.50 | <input type="checkbox"/> |
| Northwind Traders Dried Apples | £39.75 | <input type="checkbox"/> |
| Northwind Traders Marmalade | £60.75 | <input type="checkbox"/> |
| * | £0.00 | <input type="checkbox"/> |

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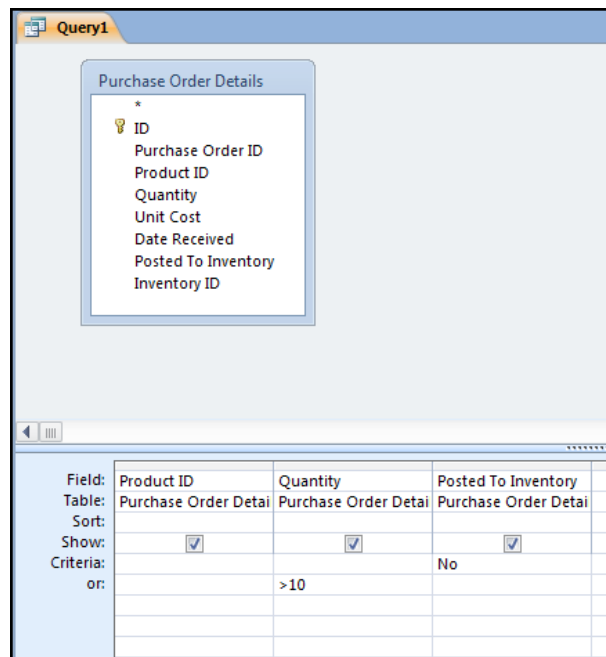
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Create A Select Query With Multiple Criteria

Using "OR"

The **ANDOR** operations are much more useful in a query and are entered differently remember a query is merely a saved advanced filter and so we will move into proper query building from this section onwards

- To create query using OR
MOUSE



1. Create a query in design view.
2. Add the **PURCHASE ORDER DETAILS** table
3. Close the **SHOW TABLE** dialogue
4. Add the fields **PRODUCT ID**, **QUANTITY** and **POSTED TO INVENTORY**.
5. The **POSTED TO INVENTORY** is a **YES/NO** data type so enter **NO** in the first criteria row.
6. In the next row down enter >10 in the cell.
7. Our criteria reads now:
8. Where our quantity is greater than 10 **OR** it has not been posted to inventory.
9. Sort the **POSTED TO INVENTORY** field descending.
10. Run the query.

| Product | Quantity | Posted To Inventory |
|---|----------|-------------------------------------|
| Northwind Traders Chocolate Biscuits Mi | 20 | <input type="checkbox"/> |
| Northwind Traders Coffee | 300 | <input type="checkbox"/> |
| Northwind Traders Mozzarella | 40 | <input type="checkbox"/> |
| Northwind Traders Chai | 40 | <input type="checkbox"/> |
| Northwind Traders Syrup | 50 | <input type="checkbox"/> |
| Northwind Traders Cajun Seasoning | 40 | <input type="checkbox"/> |
| Northwind Traders Boysenberry Spread | 10 | <input type="checkbox"/> |
| Northwind Traders Chai | 1 | <input type="checkbox"/> |
| Northwind Traders Crab Meat | 120 | <input type="checkbox"/> |
| Northwind Traders Marmalade | 40 | <input type="checkbox"/> |
| Northwind Traders Brownie Mix | 10 | <input type="checkbox"/> |
| Northwind Traders Dried Apples | 40 | <input type="checkbox"/> |
| Northwind Traders Dried Apples | 40 | <input checked="" type="checkbox"/> |
| Northwind Traders Beer | 60 | <input checked="" type="checkbox"/> |
| Northwind Traders Crab Meat | 120 | <input checked="" type="checkbox"/> |
| Northwind Traders Clam Chowder | 40 | <input checked="" type="checkbox"/> |
| Northwind Traders Long Grain Rice | 100 | <input checked="" type="checkbox"/> |
| Northwind Traders Chocolate | 100 | <input checked="" type="checkbox"/> |
| Northwind Traders Scones | 20 | <input checked="" type="checkbox"/> |
| Northwind Traders Dried Pears | 40 | <input checked="" type="checkbox"/> |
| Northwind Traders Gnocchi | 120 | <input checked="" type="checkbox"/> |
| Northwind Traders Coffee | 100 | <input checked="" type="checkbox"/> |
| Northwind Traders Marmalade | 40 | <input checked="" type="checkbox"/> |

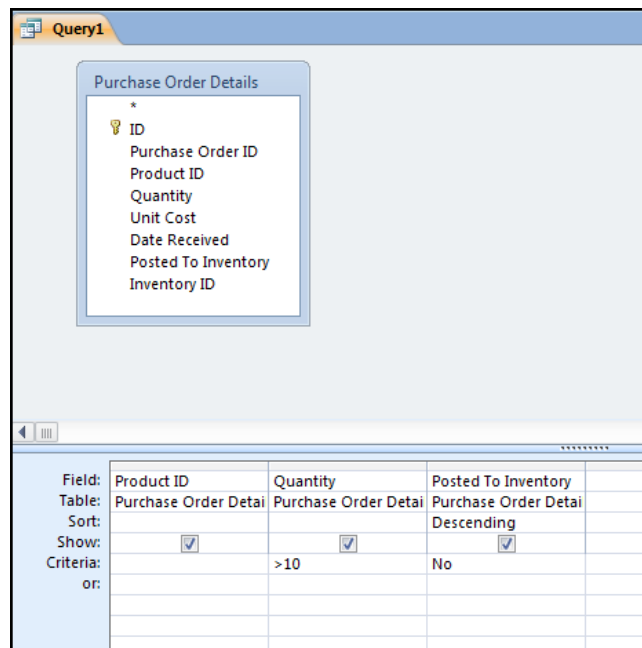
Record: 1 of 54 No Filter Search

11. As you can see from the results for each record the quantity is either over 10 OR it has not been posted to inventory.

Using "AND"

This time we will use the same criteria but we will use AND instead.

► To create query using OR
MOUSE



1. Create a query in design view.
2. Add the **PURCHASE ORDER DETAILS** table
3. Close the **SHOW TABLE** dialogue
4. Add the fields **PRODUCT ID**, **QUANTITY** and **POSTED TO INVENTORY**.
5. The **POSTED TO INVENTORY** is a **YES/NO** data type so enter **NO** in the first criteria row.
6. In the **SAME** row enter **>10** in the cell.
7. Our criteria reads now:
8. Where our quantity is greater than 10 **AND** it has not been posted to inventory.
9. Sort the **POSTED TO INVENTORY** field descending.
10. Run the query.

| Product | Quantity | Posted To Inventory |
|--|----------|--------------------------|
| Northwind Traders Mozzarella | 40 | <input type="checkbox"/> |
| Northwind Traders Crab Meat | 120 | <input type="checkbox"/> |
| Northwind Traders Dried Apples | 40 | <input type="checkbox"/> |
| Northwind Traders Marmalade | 40 | <input type="checkbox"/> |
| Northwind Traders Cajun Seasoning | 40 | <input type="checkbox"/> |
| Northwind Traders Syrup | 50 | <input type="checkbox"/> |
| Northwind Traders Chocolate Biscuits Mix | 20 | <input type="checkbox"/> |
| Northwind Traders Chai | 40 | <input type="checkbox"/> |
| Northwind Traders Coffee | 300 | <input type="checkbox"/> |
| * | | <input type="checkbox"/> |

- As you can see from the results for each record the quantity is Both over 10 AND it has not been posted to inventory.
- The action of the AND operation reduces the number of records that are returned and the OR operation increases the number of records returned.

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Text Criteria (“Like” Operator With Wildcards)

Text criteria usually involves exact strings of text that you are looking for as long as the text criteria are in speech marks then you only have to worry about your spelling. We will try a query using the like operator for queries. Here are some Critirion Wildcards

| | | |
|-----|---|---|
| * | Matches any number of characters. It can be used as the first or last character in the character string. | Wh* finds what, white, where and why (plus many others) |
| ? | Matches any single alphabetic character. | B?ll finds ball, bell, and bill and bull |
| [] | Matches any single character within the brackets. | B[ae]ll finds ball and bell but not bill |
| ! | Matches any character not in the brackets. | B[!ae]ll finds bill and bull but not bell |
| - | Matches any one of a range of characters. You must specify the range in ascending order (a to z, not z to a). | B[a-c]d finds bad, bbd, and bcd |

We will now try a query using some text criteria and a wildcard. We would like to find from the employees table all the sales representatives.

The screenshot shows a query named 'Query1' with three columns: 'First Name', 'Last Name', and 'Job Title'. The data is as follows:

| First Name | Last Name | Job Title |
|------------|----------------|-----------------------|
| Nancy | Freehafer | Sales Representative |
| Andrew | Cencini | Vice President, Sales |
| Jan | Kotas | Sales Representative |
| Mariya | Sergienko | Sales Representative |
| Steven | Thorpe | Sales Manager |
| Michael | Neipper | Sales Representative |
| Robert | Zare | Sales Representative |
| Laura | Giussani | Sales Coordinator |
| Anne | Hellung-Larser | Sales Representative |
| * | | |

Look at the plain data above. There are many people in sales such as the coordinator manager and vice president. We could have used

Like “sales*”

But this would only show all the others (apart from the vice president) so since we want the representatives we Can use either:

“Sales Representative” or Like “*representative” or Like “*rep*”

► To build a query with text criteria.

MOUSE

| | | | |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|
| Field: | First Name | Last Name | Job Title |
| Table: | Employees | Employees | Employees |
| Sort: | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | | | Like "*rep*" |
| or: | | | |

1. Build a query in design view.
2. Add the employees table to the query
3. Add the **FIRST NAME**, **LAST NAME** and **JOB TITLE** fields to the design grid.

| First Name | Last Name | Job Title |
|------------|----------------|----------------------|
| Nancy | Freehafer | Sales Representative |
| Jan | Kotas | Sales Representative |
| Mariya | Sergienko | Sales Representative |
| Michael | Neipper | Sales Representative |
| Robert | Zare | Sales Representative |
| Anne | Hellung-Larser | Sales Representative |

4. Close the show table dialogue.
5. Enter one of the like criteria as mentioned above into the design grid
6. Run the query.

Other Criteria

Here is a list of other characters that may help you find the data you are looking for we will test a few of these.

| Reserved characters | Explanation | Example | Includes records with |
|---------------------|---------------------------------------|---------------------------------------|--|
| " " | Used around text | "Bananas" | Bananas |
| # # | Used around dates | #16/01/06# | Date is 16/01/06 |
| < | Less than | <300 | Any number less than (but not including) 300 |
| > | Greater than | >300 | Any number greater than (but not including) 300 |
| >= | Greater than or equal to | >=300 | Any number that is 300 or above |
| <= | Less than or equal to | <=300 | Any number that is 300 or below |
| Null | No value in the field | Is null | Any record where a specified field is empty |
| Not | Excluding values | Not "jones" | Do not include any records that contain the word jones |
| In | Select records in | In ("london, "birmingham", "bristol") | Records that contain london, birmingham or bristol |
| Or | Meets either criteria | "london" or "birmingham" | Find records that contain either london or birmingham |
| And | Meets both criteria | >=21 and <60 | Find records between 20 and 60 |
| Between | Between to numbers or dates | Between 300 and 1000 | Any records that fall between 300 and 1000 |
| Date() | Today's date | =date() | Display the current date |
| # | Matches any single numeric character. | 1#3 | finds 103, 113, 123 |

Using "OR" for multiple values (2nd method)

Another way of using OR is to use the text itself in a criteria cell.

► To use OR

mouse

1. Build a query in design view.
2. Add the employees table to the query


3. Add the **FIRST NAME**, **LAST NAME** and **JOB TITLE** fields to the design grid.
4. In the criteria cell in the **FIRST NAME** field enter the following syntax
Like "A*" Or Like "M*"

| | | | |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|
| Field: | First Name | Last Name | Job Title |
| Table: | Employees | Employees | Employees |
| Sort: | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | Like "A*" Or Like "M*" | | |
| or: | | | |

5. When this criteria is entered run the query.
6. The results are on the next page.
7. As you can see all those people whose first name start with A or M are now shown in the results

| First Name | Last Name | Job Title |
|------------|----------------|-----------------------|
| Andrew | Cencini | Vice President, Sales |
| Mariya | Sergienko | Sales Representative |
| Michael | Neipper | Sales Representative |
| Anne | Hellung-Larser | Sales Representative |
| * | | |

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Using "AND" for multiple values (2nd method)

Another way of using AND is to use the text itself in a criteria cell.

► To use AND
MOUSE

1. Build a query in design view.
2. Add the Products table to the query
3. Add the **PRODUCT ID**, **PRODUCT NAME** and **STANDARD COST** fields to the design grid.
4. In the criteria cell in the **STANDARD COST** field enter the following syntax
 ≥ 10 AND ≤ 20
5. Run the query the results are shown below.

| ID | Product Name | Standard Cost |
|---------|--------------------------------------|---------------|
| 1 | Northwind Traders Chai | £13.50 |
| 4 | Northwind Traders Cajun Seasoning | £16.50 |
| 5 | Northwind Traders Olive Oil | £16.01 |
| 6 | Northwind Traders Boysenberry Spread | £18.75 |
| 14 | Northwind Traders Walnuts | £17.44 |
| 34 | Northwind Traders Beer | £10.50 |
| 40 | Northwind Traders Crab Meat | £13.80 |
| 57 | Northwind Traders Ravioli | £14.63 |
| 65 | Northwind Traders Hot Pepper Sauce | £15.79 |
| 66 | Northwind Traders Tomato Sauce | £12.75 |
| 86 | Northwind Traders Cake Mix | £10.50 |
| * ***** | | £0.00 |

6. The records returned are greater or equal to ten AND less than or equal to 20

Using "IS NULL" and "NOT"

The **IS NULL** command will return records where the value in the column has not been entered where it **IS NULL**. In conjunction with **NOT** we can find records that are **NOT NULL (IS NOT NULL)** or not empty. This can be useful in an address list where you want a list of people to phone and you want the list to return only those with phone numbers.

Make a copy of the northwind database and open the copy.

Open the customers table and delete the phone numbers from a number of customers. As in the following picture and we are ready to start.

| | First Name | E-mail Address | Job Title | Business Ph | Home |
|---|---------------|----------------|-------------------------|---------------|------|
| + | Anna | | Owner | (123)555-0100 | |
| + | Antonio | | Owner | | |
| + | Thomas | | Purchasing Representati | (123)555-0100 | |
| + | Christina | | Purchasing Manager | (123)555-0100 | |
| + | Martin | | Owner | (123)555-0100 | |
| + | Francisco | | Purchasing Manager | | |
| + | Ming-Yang | | Owner | (123)555-0100 | |
| + | Elizabeth | | Purchasing Representati | (123)555-0100 | |
| + | Sven | | Purchasing Manager | (123)555-0100 | |
| + | Roland | | Purchasing Manager | (123)555-0100 | |
| + | Peter | | Purchasing Manager | | |
| + | John | | Purchasing Manager | (123)555-0100 | |
| + | Andre | | Purchasing Representati | (123)555-0100 | |
| + | Carlos | | Purchasing Representati | (123)555-0100 | |
| + | Helena | | Purchasing Manager | | |
| + | Daniel | | Purchasing Representati | (123)555-0100 | |
| + | Jean Philippe | | Owner | | |
| + | Catherine | | Purchasing Representati | (123)555-0100 | |
| + | Alexander | | Accounting Assistant | (123)555-0100 | |
| + | George | | Purchasing Manager | (123)555-0100 | |
| + | Bernard | | Accounting Manager | | |
| + | Luciana | | Purchasing Assistant | (123)555-0100 | |
| + | Michael | | Purchasing Manager | (123)555-0100 | |
| + | Jonas | | Owner | (123)555-0100 | |
| + | John | | Purchasing Manager | (123)555-0100 | |
| + | Run | | Accounting Assistant | (123)555-0100 | |
| + | Karen | | Purchasing Manager | (123)555-0100 | |
| + | Amritansh | | Purchasing Manager | (123)555-0100 | |
| + | Soo Jung | | Purchasing Manager | (123)555-0100 | |

First we will find those without phone numbers

► To use NULL and NOT

MOUSE

1. Build a query in design view.

| Field: | First Name | Last Name | Business Phone |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|
| Table: | Customers | Customers | Customers |
| Sort: | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | | | Is Null |
| or: | | | |

2. Add the Customers table to the query

3. Add the **FIRST NAME**, **LAST NAME** and **BUSINESS PHONE** field to the design grid.
4. In the criteria for the business phone field enter **IS NULL**.
5. Run the query

| First Name | Last Name | Business Phone |
|---------------|------------------|----------------|
| Antonio | Gratacos Solsona | |
| Francisco | Pérez-Olaeta | |
| Peter | Krschne | |
| Helena | Kupkova | |
| Jean Philippe | Bagel | |
| Bernard | Tham | |
| * | | |

6. As you can see only those without phone numbers are displayed Now we will find only those with phone numbers
7. Return to design view and change the criteria to **IS NOT NULL**.

| Field: | First Name | Last Name | Business Phone |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|
| Table: | Customers | Customers | Customers |
| Sort: | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | | | Is Not Null |
| or: | | | |

8. Run the query the data should show as follows.

| First Name | Last Name | Business Phone |
|------------|---------------|----------------|
| Anna | Bedecs | (123)555-0100 |
| Thomas | Axen | (123)555-0100 |
| Christina | Lee | (123)555-0100 |
| Martin | O'Donnell | (123)555-0100 |
| Ming-Yang | Xie | (123)555-0100 |
| Elizabeth | Andersen | (123)555-0100 |
| Sven | Mortensen | (123)555-0100 |
| Roland | Wacker | (123)555-0100 |
| John | Edwards | (123)555-0100 |
| Andre | Ludick | (123)555-0100 |
| Carlos | Grilo | (123)555-0100 |
| Daniel | Goldschmidt | (123)555-0100 |
| Catherine | Autier Miconi | (123)555-0100 |
| Alexander | Eggerer | (123)555-0100 |
| George | Li | (123)555-0100 |
| Luciana | Ramos | (123)555-0100 |
| Michael | Entin | (123)555-0100 |
| Jonas | Hasselberg | (123)555-0100 |
| John | Rodman | (123)555-0100 |
| Run | Liu | (123)555-0100 |
| Karen | Toh | (123)555-0100 |
| Amritansh | Raghav | (123)555-0100 |
| Soo Jung | Lee | (123)555-0100 |
| * | | |

“BETWEEN” and “AND”

When working with numbers, currency or dates you may wish to bring back a range of figures from your data. We have done this using greater than and less than but this can be a little clumsy the **BETWEEN** and **AND** reserved words within access make life much simpler it is pointed out that they are inclusive of any figures you enter so entering equals is no longer necessary.

► To use BETWEEN and AND

MOUSE

1. Build a query in design view.
2. Add the Products table to the query

| | | | |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|
| Field: | ID | Product Name | Standard Cost |
| Table: | Products | Products | Products |
| Sort: | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | | | Between 2 And 9 |
| or: | | | |

3. Add the **PRODUCT ID**, **PRODUCT NAME** and **STANDARD COST** fields to the design grid.
4. Enter the criteria:
Between 2 And 9
5. Run the query.
6. Sort the **STANDARD COST** column ascending
7. As you can see all values within the range specified are returned Including those priced at 2 and 9

| ID | Product Name | Standard Cost |
|---------|--|---------------|
| 96 | Northwind Traders Smoked Salmon | £2.00 |
| 87 | Northwind Traders Tea | £2.00 |
| 82 | Northwind Traders Granola | £2.00 |
| 81 | Northwind Traders Green Tea | £2.00 |
| 97 | Northwind Traders Hot Cereal | £3.00 |
| 80 | Northwind Traders Dried Plums | £3.00 |
| 52 | Northwind Traders Long Grain Rice | £5.25 |
| 19 | Northwind Traders Chocolate Biscuits Mix | £6.90 |
| 41 | Northwind Traders Clam Chowder | £7.24 |
| 74 | Northwind Traders Almonds | £7.50 |
| 21 | Northwind Traders Scones | £7.50 |
| 3 | Northwind Traders Syrup | £7.50 |
| 85 | Northwind Traders Brownie Mix | £9.00 |
| * ##### | | £0.00 |

Date Range Criteria

We can use this **BETWEEN** and **AND** criteria to help us with date ranges we will build a query first looking for a specific date and then between a range of dates. The hash key is used to surround a date so access can understand what it is.

► To query a specific date

MOUSE

| | | | |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|
| Field: | Customer ID | Order Date | Ship City |
| Table: | Orders | Orders | Orders |
| Sort: | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | | #24/03/2006# | |
| or: | | | |

1. Build a query in design view.
2. Add the orders table to the query
3. Add the fields **CUSTOMER ID**, **ORDER DATE** and **SHIP CITY**

| Customer | Order Date | Ship City |
|-----------|------------|-----------|
| Company J | 24/03/2006 | Chicago |
| Company G | 24/03/2006 | Boise |
| Company J | 24/03/2006 | Chicago |
| Company K | 24/03/2006 | Miami |
| Company A | 24/03/2006 | Seattle |
| * | 28/04/2010 | |

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4. In the **ORDER DATE** criteria cell enter the following criteria.
#24/03/2006#
5. Run the query and the following records should be returned.

► To return a range of dates
MOUSE

6. Return to design view and change the criteria to a date range enter
Between #01/04/2006# And #30/04/2006#
7. The between and and as before work the same way as **>= AND <=** to return a range of dates the above criteria should show all the orders for April 2006.

| | | | |
|-----------|-------------------------------------|---------------------------------------|-------------------------------------|
| Field: | Customer ID | Order Date | Ship City |
| Table: | Orders | Orders | Orders |
| Sort: | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | | Between #01/04/2006# And #30/04/2006# | |
| or: | | | |

Using Multiple Tables In Queries

When you are extracting data from your database you will need to pull information from various tables to make sense of the data. In one table like the orders table we have just seen it may contain the customer ID field but that will not pull out information from the company similarly it may contain the Product ID but nothing else about the product we will need to create queries based on more than one table to bring out any meaningful data especially if we have to build a report on it later. Let us find out some extra information from our database based on more than one table. It is important that the tables are related.

| Customer | Order Date | Ship City |
|------------|------------|----------------|
| Company BB | 07/04/2006 | Memphis |
| Company I | 05/04/2006 | Salt Lake City |
| Company F | 08/04/2006 | Milwaukee |
| Company H | 05/04/2006 | Portland |
| Company Y | 05/04/2006 | Chicago |
| Company Z | 05/04/2006 | Miami |
| Company CC | 05/04/2006 | Denver |
| Company F | 03/04/2006 | Milwaukee |
| Company AA | 22/04/2006 | Las Vegas |
| Company D | 22/04/2006 | New York |
| Company L | 22/04/2006 | Las Vegas |
| Company H | 30/04/2006 | Portland |
| Company D | 07/04/2006 | New York |
| Company CC | 12/04/2006 | Denver |
| Company C | 25/04/2006 | Los Angelas |
| Company D | 25/04/2006 | New York |
| Company C | 25/04/2006 | Los Angelas |
| * | 28/04/2010 | |

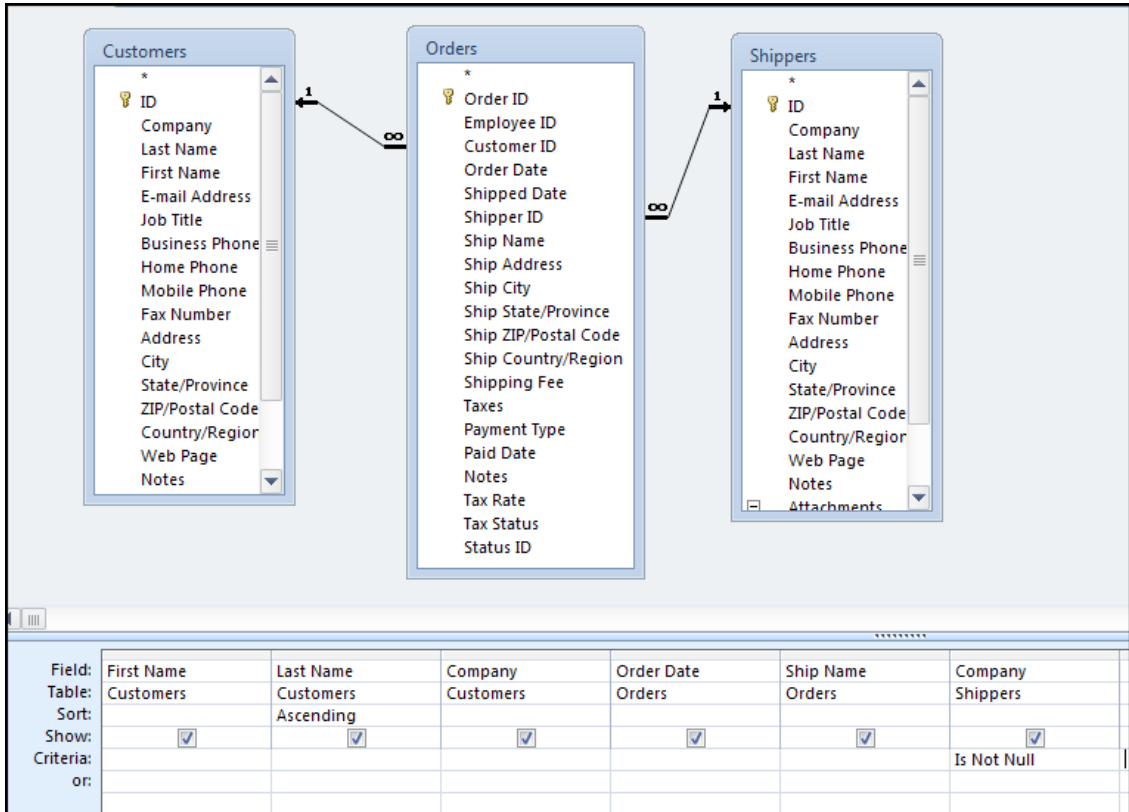
Query across 3 tables

We will build a query across 3 tables in the northwind database and pull out the related information we will then save the query for later use in a report

► To build a Query across multiple tables

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1. Build a query in design view.
2. We will add the Shippers table, the Orders table and the Customers table to the Query.



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3. Add the fields as shown in the picture above please note which table they are from from the table row. For instance the **FIRST NAME**, **LAST NAME** and **COMPANY** fields are from the customers table not the shippers table and the the last **COMPANY** name field is from the shippers. Only the order date comes from the orders table
4. Please note the relationship joins we will look at these in more depth later but they show a definite relationship between the tables.
5. Sort the **LAST NAME** field ascending
6. The **IS NOT NULL** criteria is entered in the **SHIPPERS.COMPANY** field as a number of orders have not yet been assigned to a ship (order has not gone through yet)
7. When we run this query we will know who is to receive an order on a specific date and what ship it will be on. If necessary adjust the column widths in datasheet view. It should look like it does below. There should be 43 records.

| First Name | Last Name | Customers.Company | Order Date | Ship Name | Shippers.Company |
|------------|--------------|-------------------|------------|------------------------|--------------------|
| Elizabeth | Andersen | Company H | 24/05/2006 | Elizabeth Andersen | Shipping Company C |
| Elizabeth | Andersen | Company H | 22/03/2006 | Elizabeth Andersen | Shipping Company C |
| Elizabeth | Andersen | Company H | 30/04/2006 | Elizabeth Andersen | Shipping Company C |
| Elizabeth | Andersen | Company H | 05/06/2006 | Elizabeth Andersen | Shipping Company B |
| Elizabeth | Andersen | Company H | 05/04/2006 | Elizabeth Andersen | Shipping Company B |
| Elizabeth | Andersen | Company H | 30/01/2006 | Elizabeth Andersen | Shipping Company C |
| Thomas | Axen | Company C | 25/04/2006 | Thomas Axen | Shipping Company B |
| Thomas | Axen | Company C | 23/02/2006 | Thomas Axen | Shipping Company B |
| Anna | Bedecs | Company A | 24/05/2006 | Anna Bedecs | Shipping Company C |
| John | Edwards | Company L | 22/04/2006 | John Edwards | Shipping Company B |
| John | Edwards | Company L | 22/01/2006 | John Edwards | Shipping Company B |
| Peter | Krschne | Company K | 24/05/2006 | Peter Krschne | Shipping Company C |
| Peter | Krschne | Company K | 24/03/2006 | Peter Krschne | Shipping Company C |
| Soo Jung | Lee | Company CC | 12/04/2006 | Soo Jung Lee | Shipping Company B |
| Soo Jung | Lee | Company CC | 05/04/2006 | Soo Jung Lee | Shipping Company B |
| Soo Jung | Lee | Company CC | 05/06/2006 | Soo Jung Lee | Shipping Company B |
| Christina | Lee | Company D | 07/04/2006 | Christina Lee | Shipping Company C |
| Christina | Lee | Company D | 20/01/2006 | Christina Lee | Shipping Company A |
| Christina | Lee | Company D | 22/04/2006 | Christina Lee | Shipping Company A |
| Soo Jung | Lee | Company CC | 10/02/2006 | Soo Jung Lee | Shipping Company B |
| Christina | Lee | Company D | 06/02/2006 | Christina Lee | Shipping Company C |
| Run | Liu | Company Z | 05/04/2006 | Run Liu | Shipping Company C |
| Run | Liu | Company Z | 05/06/2006 | Run Liu | Shipping Company C |
| Sven | Mortensen | Company I | 05/06/2006 | Sven Mortensen | Shipping Company A |
| Sven | Mortensen | Company I | 05/04/2006 | Sven Mortensen | Shipping Company A |
| Francisco | Pérez-Olaeta | Company F | 06/03/2006 | Francisco Pérez-Olaeta | Shipping Company B |
| Francisco | Pérez-Olaeta | Company F | 08/04/2006 | Francisco Pérez-Olaeta | Shipping Company B |
| Francisco | Pérez-Olaeta | Company F | 09/05/2006 | Francisco Pérez-Olaeta | Shipping Company B |
| Francisco | Pérez-Olaeta | Company F | 08/06/2006 | Francisco Pérez-Olaeta | Shipping Company B |
| Francisco | Pérez-Olaeta | Company F | 03/04/2006 | Francisco Pérez-Olaeta | Shipping Company C |
| Francisco | Pérez-Olaeta | Company F | 23/06/2006 | Francisco Pérez-Olaeta | Shipping Company C |
| Amritansh | Raghav | Company BB | 07/06/2006 | Amritansh Raghav | Shipping Company C |

- Go back to design view and set the criteria to show Aprils orders it should be on the same row as **IS NOT NULL**
Between #01/04/2006# And #30/04/2006#

| | | | | | | |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Field: | First Name | Last Name | Company | Order Date | Ship Name | Company |
| Table: | Customers | Customers | Customers | Orders | Orders | Shippers |
| Sort: | | Ascending | | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | | | | Between #01/04/2006 | | Is Not Null |
| or: | | | | | | |

- The data should appear as below

| First Name | Last Name | Customers.Company | Order Date | Ship Name | Shippers.Company |
|------------|--------------|-------------------|------------|------------------------|--------------------|
| Elizabeth | Andersen | Company H | 30/04/2006 | Elizabeth Andersen | Shipping Company C |
| Elizabeth | Andersen | Company H | 05/04/2006 | Elizabeth Andersen | Shipping Company B |
| Thomas | Axen | Company C | 25/04/2006 | Thomas Axen | Shipping Company B |
| John | Edwards | Company L | 22/04/2006 | John Edwards | Shipping Company B |
| Soo Jung | Lee | Company CC | 12/04/2006 | Soo Jung Lee | Shipping Company B |
| Christina | Lee | Company D | 07/04/2006 | Christina Lee | Shipping Company C |
| Christina | Lee | Company D | 22/04/2006 | Christina Lee | Shipping Company A |
| Soo Jung | Lee | Company CC | 05/04/2006 | Soo Jung Lee | Shipping Company B |
| Run | Liu | Company Z | 05/04/2006 | Run Liu | Shipping Company C |
| Sven | Mortensen | Company I | 05/04/2006 | Sven Mortensen | Shipping Company A |
| Francisco | Pérez-Olaeta | Company F | 03/04/2006 | Francisco Pérez-Olaeta | Shipping Company C |
| Francisco | Pérez-Olaeta | Company F | 08/04/2006 | Francisco Pérez-Olaeta | Shipping Company B |
| Amritansh | Raghav | Company BB | 07/04/2006 | Amritansh Raghav | Shipping Company C |
| John | Rodman | Company Y | 05/04/2006 | John Rodman | Shipping Company A |
| Karen | Toh | Company AA | 22/04/2006 | Karen Toh | Shipping Company B |
| * | | | | | |

- Save the query as QryShippedOrdersInApril and close it

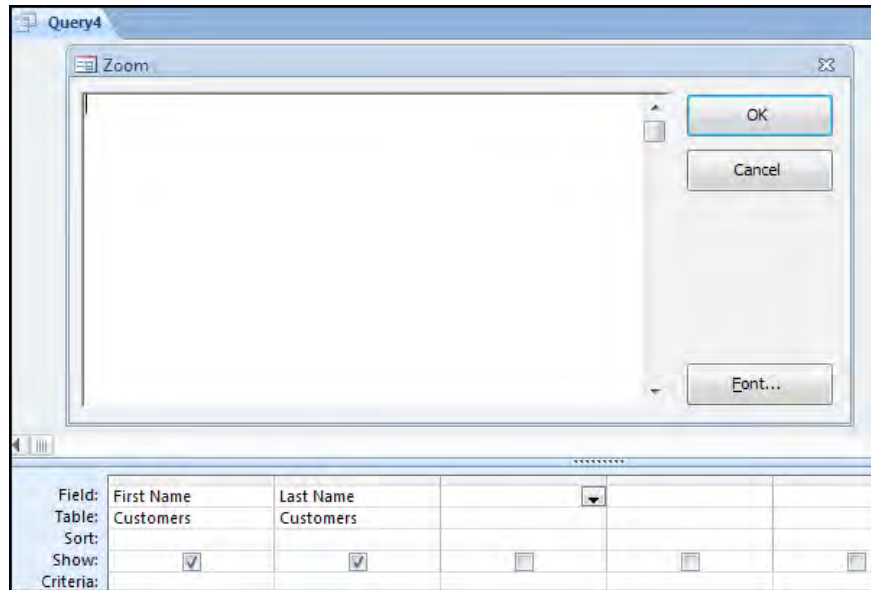
The Zoom Window and Concatenation

The zoom window is a very useful tool as you have seen in the previous exercises it can be difficult to enter long strings of criteria into one of those small columns in the design grid the zoom window gives you the space to enter it easily plus we can make the font larger so it is easier to read making mistakes in syntax less likely.

Concatenation is where we join the data from two fields together such as last name and first name to give a full name field this can be useful when creating reports. Concatenating fields is classified as an expression.

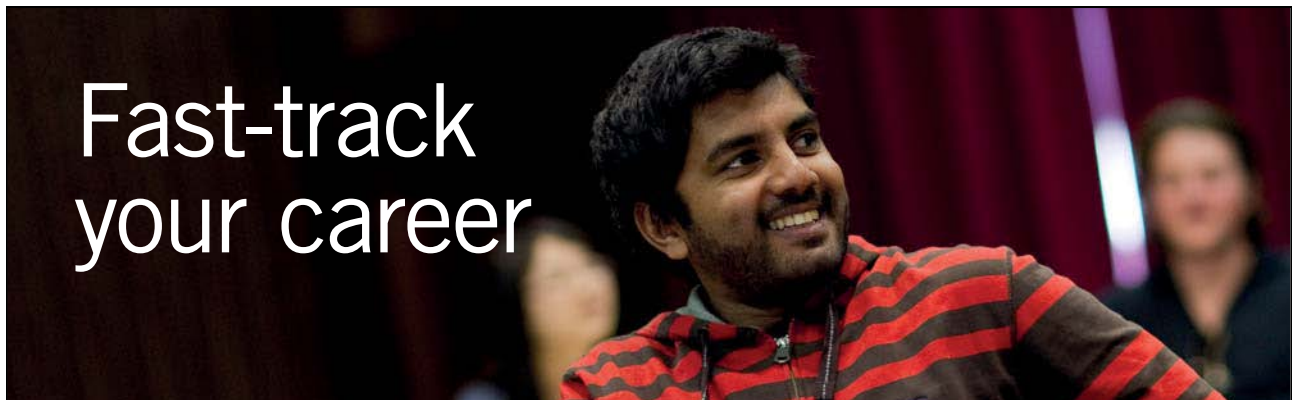
► To use the zoom window and concatenate

- Build a query in design view.
- Add the customers table
- Form the table add the first name and last name fields to the design grid and click in the field cell of the third column.
- Hold down the **SHIFT** key and press **F2** to open the zoom window



5. Click on the **FONT** button to open the font dialogue box and enlarge the font to a comfortable size (say 12 or 14) click on **OK** to close the **FONT** dialogue

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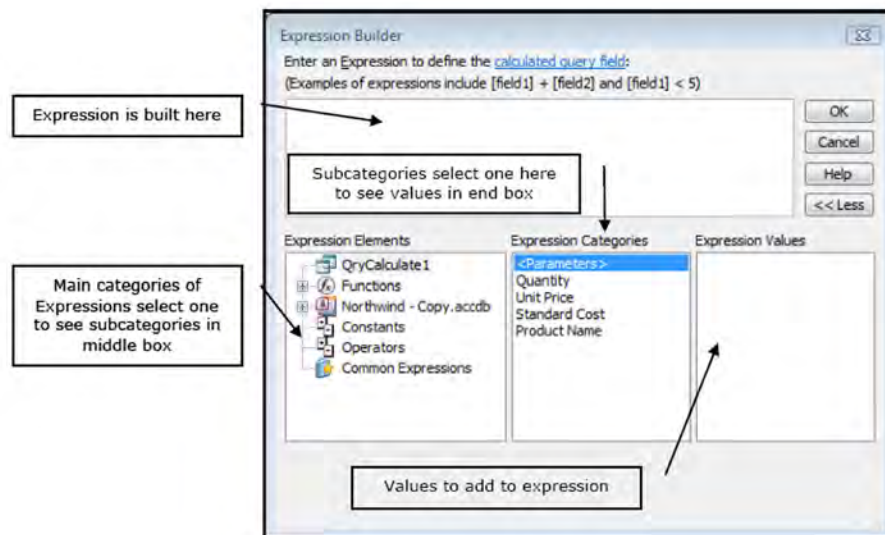
6. Fields when written in expressions should be enclosed in square brackets and spelling is very important even a space in the wrong place will cause an error message and the expression will be invalid. (This is why earlier when we were building tables you were advised not to leave any spaces within a fieldname.)
7. We need to name the new calculated field we are creating so we do that first followed by a colon
FullName:
8. Then we enter the first part of our expression we want to join the **FIRST NAME** to the **LAST NAME** so we enter the first name field in square brackets, since our first name field has a space we must enter it exactly the same way.
FullName:[First Name]
9. Now we need to use the concatenate symbol which is the ampersand (&)
FullName:[First Name]&
10. Now if we just join both fields together the text will run into one string of text so we need to join the first name to a space and since this is text we must show that by enclosing it in speech marks.
FullName:[First Name]&" "
11. Then we must use the concatenate symbol again to specify this piece of text is to be joined to something else.
FullName:[First Name]&" "&
12. Finally we add the **Final** field it is to be joined to, the **LAST NAME** field.
FullName:[First Name]&" "&[Last Name]
 - Please note we have entered no extra characters in our expression.
13. Click on **OK** to enter our Expression into the field area of the design grid and press return for access to accept it. As you can see the syntax is far longer than the width of the column and although you may adjust the width of the column the speech marks are difficult to see. If you need to edit the concatenated field select it and press **SHIFT + F2**
14. Run the query to see the results.
15. Adjust column widths and sort by FullName field

| First Name | Last Name | FullName |
|---------------|------------------|--------------------------|
| Alexander | Eggerer | Alexander Eggerer |
| Amritansh | Raghav | Amritansh Raghav |
| Andre | Ludick | Andre Ludick |
| Anna | Bedecs | Anna Bedecs |
| Antonio | Gratacos Solsona | Antonio Gratacos Solsona |
| Bernard | Tham | Bernard Tham |
| Carlos | Grilo | Carlos Grilo |
| Catherine | Autier Miconi | Catherine Autier Miconi |
| Christina | Lee | Christina Lee |
| Daniel | Goldschmidt | Daniel Goldschmidt |
| Elizabeth | Andersen | Elizabeth Andersen |
| Francisco | Pérez-Olaeta | Francisco Pérez-Olaeta |
| George | Li | George Li |
| Helena | Kupkova | Helena Kupkova |
| Jean Philippe | Bagel | Jean Philippe Bagel |
| John | Edwards | John Edwards |
| John | Rodman | John Rodman |
| Jonas | Hasselberg | Jonas Hasselberg |
| Karen | Toh | Karen Toh |

16. Save as QryFullName and close the query

Expression Builder

Just to explain the parts of the expression builder it is accessed by clicking on the builder button on the query setup group of the query design ribbon.



Calculated Fields

We can calculate fields within Access either by typing them in manually as we did with the concatenation or we can use the **EXPRESSION BUILDER** which allows us the access to many different functions available in access. We will now calculate a field using the **EXPRESSION BUILDER** although this is used as an example there are many other uses for it and as you become more proficient with it, your mastery over access will increase the **EXPRESSION BUILDER** is also available in **FORMS** and **REPORTS**.

Looking again at the northwind database we will look at the **ORDER DETAILS** table and the products table and calculate the subtotal of each order detail. Later we will total this.

► To build a calculation

MOUSE

1. Create a query in design view
2. Add the order details and the product tables to the grid
3. Add the **QUANTITY** and **UNIT PRICE** fields from the order details table
4. Add the **STANDARD COST** and the **PRODUCT** name from the product table.
5. In the fifth column click in the field cell.
6. Save the Query as “QryCalculate1” (this allows us to see the fields from this query in the expression builder.)
7. On the **QUERY SETUP** group of the ribbon click on **BUILDER** the expression builder dialogue box will open.

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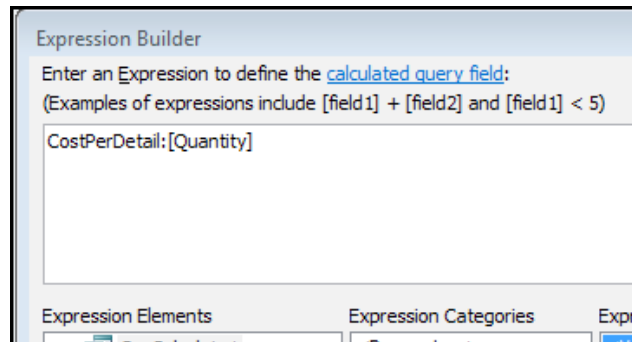
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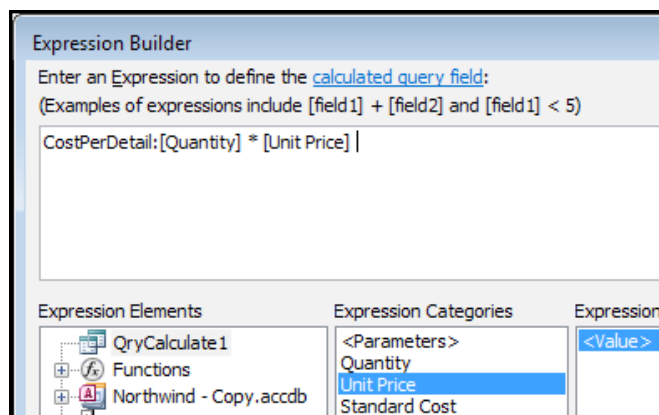
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8. Select the Qrycalculate1 in the far left box if it is not selected to see the fields available in the centre box.
9. Now if you double click on **QUANTITY** the field name should appear In the topbox it will be preceded by <<EXPR>>
 - We cannot change font size here as we did with zoom so care must be taken when typing.
10. In the topmost box we must enter a new fieldname for the expression select the <<EXPR>>and delete it and type:

CostPerDetail:



11. Now we need to multiply the quantity.
12. In the bottom left box select **OPERATORS**.
13. In the middle box select **ARITHMETIC**
14. In the right box double-click on the asterisk it then should appear after quantity.
15. Select the QryCalculate1 option on the far left again.
16. Double click on the **UNIT PRICE** field in the centre of the builder. It should appear after the asterisk.



17. Click on OK to close the builder and press enterfor access to accept you calculated field.
18. Sort by CostPerDetail ascending
19. Run the query

- 20. Adjust column sizes and save the changes to the query. there should be 58 records the first few should appear as in the following image
- 21. Do not close the query.

| Quantity | Unit Price | Standard Cost | Product Name | CostPerDetail |
|----------|------------|---------------|--|---------------|
| 0 | £38.00 | £28.50 | Northwind Traders Gnocchi | 0 |
| 0 | £2.99 | £2.00 | Northwind Traders Green Tea | 0 |
| 10 | £3.50 | £3.00 | Northwind Traders Dried Plums | 35 |
| 15 | £3.50 | £3.00 | Northwind Traders Dried Plums | 52.5 |
| 20 | £3.50 | £3.00 | Northwind Traders Dried Plums | 70 |
| 25 | £2.99 | £2.00 | Northwind Traders Green Tea | 74.75 |
| 10 | £9.20 | £6.90 | Northwind Traders Chocolate Biscuits Mix | 92 |
| 10 | £9.65 | £7.24 | Northwind Traders Clam Chowder | 96.5 |
| 30 | £3.50 | £3.00 | Northwind Traders Dried Plums | 105 |
| 3 | £40.00 | £30.00 | Northwind Traders Curry Sauce | 120 |
| 10 | £12.75 | £9.56 | Northwind Traders Chocolate | 127.5 |
| 10 | £12.75 | £9.56 | Northwind Traders Chocolate | 127.5 |
| 50 | £2.99 | £2.00 | Northwind Traders Green Tea | 149.5 |
| 20 | £9.20 | £6.90 | Northwind Traders Chocolate Biscuits Mix | 184 |
| 20 | £10.00 | £7.50 | Northwind Traders Scones | 200 |
| 20 | £10.00 | £7.50 | Northwind Traders Almonds | 200 |
| 10 | £22.00 | £16.50 | Northwind Traders Cajun Seasoning | 220 |
| 25 | £9.20 | £6.90 | Northwind Traders Chocolate Biscuits Mix | 230 |
| 5 | £46.00 | £34.50 | Northwind Traders Coffee | 230 |
| 10 | £25.00 | £18.75 | Northwind Traders Boysenberry Spread | 250 |

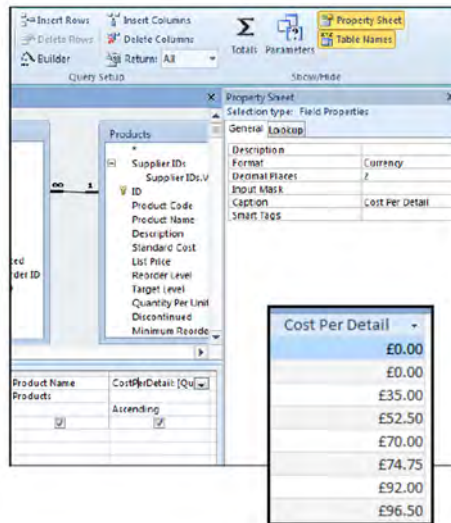
Formatting a Field

As you can see from the records our calculation has worked but it is not showing currency as we would like it to be. This next section shows how we can format our query fields as we did with our tables.

► To format a field in a Query

MOUSE

1. Open the previous query in **DESIGN** view
2. Click in the CostPerDetail Field.
3. Click on the **PROPERTY SHEET** button in the **SHOW/HIDE** group on the **DESIGN** ribbon. A pane opens up to the right of the window



4. In the **FORMAT** section choose the **CURRENCY** format.
5. Set **DECIMAL PLACES** to 2
6. Enter the **CAPTION** “Cost Per Detail” the as you would with a table.
7. Close the property sheet by clicking on the property sheet button the ribbon.
8. Save the changes
9. Run the query

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10. The cost per detail should now be in currency and the field label should have spaces. (Far Right)
11. Close the query QryCalculate1

Unique Values

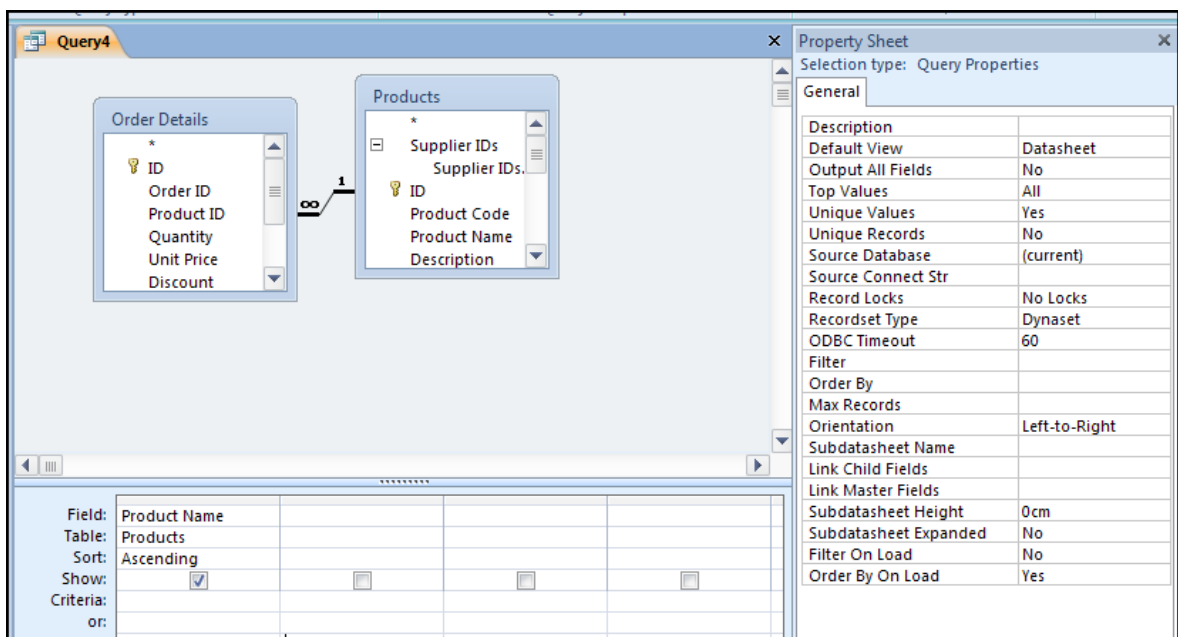
If you want to view records that contain unique values in selected fields, then in the query properties property sheet, set the unique values property to yes before you run the query.

- You can't update records in a query datasheet when the unique values property is set to yes.

We are going to see what products are on order within the .Order details table certain items are on order more than once and some not at all we want just a list of the products ordered not the duplicate ones.

► To show unique values

1. Create a new query in design view
2. From the **SHOW TABLE** dialogue box add the Order details and products tables
3. Close the **SHOW TABLE** dialogue box
4. Add the field **PRODUCT NAME** to the design grid
5. Sort the field ascending
6. Run the query
7. Make a note of the record number returned notice the duplicate values
8. Return to design view
9. Show the **PROPERTY SHEET**.
10. Instead of clicking on or near the field in the grid click on the table area of the grid (the top part of the window) that contains the tables we added the property sheet values should change to those in the picture.



11. Set the **UNIQUE VALUES** Option to yes
12. Run the query
13. Note the number of records now displayed Notice that there are now no duplicate records.
14. Save the query as QryUniqueValues and Close the Query.

Building queries on queries

Aggregate Functions (Total Row)

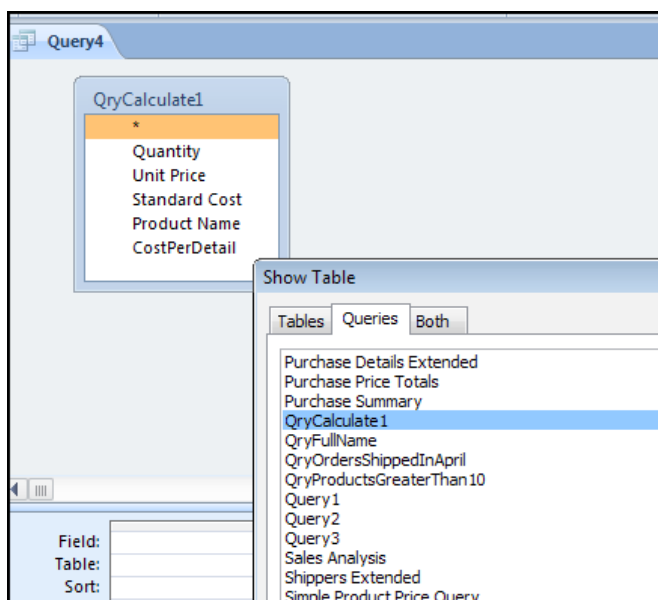
Aggregate functions mean the figures within a table or query are grouped and a function is applied to them such as the sum function or average function. This is very useful for building reports later on. We are going to build an aggregate function now and will build this on a query.

Aggregate functions can obviously be built directly onto table but this section is going to cover two aspects of queries. We are going to query one query with another query.

► To use aggregate functions

MOUSE

1. Create a new query in design view.
2. In the **SHOW TABLES** dialogue click on the **QUERIES** tab
3. Add the Qrycalculate1 query to the grid.



4. Close the **SHOW TABLE** dialogue
5. Add the product name and CostPerDetail Field to the grid.
6. Sort the product name field - **ASCENDING** and run the query.

| Product Name | Cost Per Detail |
|--|-----------------|
| Northwind Traders Almonds | £200.00 |
| Northwind Traders Beer | £1,400.00 |
| Northwind Traders Beer | £1,218.00 |
| Northwind Traders Beer | £4,200.00 |
| Northwind Traders Boysenberry Spread | £2,250.00 |
| Northwind Traders Boysenberry Spread | £250.00 |
| Northwind Traders Cajun Seasoning | £660.00 |
| Northwind Traders Cajun Seasoning | £220.00 |
| Northwind Traders Chai | £450.00 |
| Northwind Traders Chai | £270.00 |
| Northwind Traders Chocolate | £510.00 |
| Northwind Traders Chocolate | £510.00 |
| Northwind Traders Chocolate | £127.50 |
| Northwind Traders Chocolate | £1,275.00 |
| Northwind Traders Chocolate | £127.50 |
| Northwind Traders Chocolate Biscuits Mix | £92.00 |

7. As you can see from the results because the previous query shows the same product many times you were only getting a subtotal of each of the products. We will now get a true total value for each product.
8. Go back to design view

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- Click on the **TOTALS** button in the **SHOW/HIDE** group of the **DESIGN** toolbar.



- In the design grid a new row will appear called **TOTALS** and along that row below the field names it should say **GROUP BY**.

| | | |
|-----------|-------------------------------------|-------------------------------------|
| Field: | Product Name | CostPerDetail |
| Table: | QryCalculate1 | QryCalculate1 |
| Total: | Group By | Group By |
| Sort: | Ascending | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | | |
| or: | | |

- in the CostPerDetail field **GROUP BY** cell click on the drop down arrow and select **SUM**.

| | | |
|-----------|-------------------------------------|-------------------------------------|
| Field: | Product Name | CostPerDetail |
| Table: | QryCalculate1 | QryCalculate1 |
| Total: | Group By | Sum |
| Sort: | Ascending | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | | |
| or: | | |

- This means that the values in the product name will be grouped together where they are the same and the CostPerDetail will be summed together.
- Click in the CostPerDetail field.
- Click on the **PROPERTY SHEET** button on the **SHOW/HIDE** group of the **DESIGN** ribbon.
- Enter a **CAPTION** of "Total Sales"
- Set the **FORMAT** to **CURRENCY** and set **DECIMAL PLACES** to 2.
- Run the Query again and compare your data you now have a total value for each of the products.

| Product Name | Total Sales |
|--|-------------|
| Northwind Traders Almonds | £200.00 |
| Northwind Traders Beer | £6,818.00 |
| Northwind Traders Boysenberry Spread | £2,500.00 |
| Northwind Traders Cajun Seasoning | £880.00 |
| Northwind Traders Chai | £720.00 |
| Northwind Traders Chocolate | £2,550.00 |
| Northwind Traders Chocolate Biscuits Mix | £782.00 |
| Northwind Traders Clam Chowder | £2,798.50 |
| Northwind Traders Coffee | £29,900.00 |
| Northwind Traders Crab Meat | £2,208.00 |
| Northwind Traders Curry Sauce | £2,600.00 |
| Northwind Traders Dried Apples | £2,120.00 |
| Northwind Traders Dried Pears | £1,200.00 |
| Northwind Traders Dried Plums | £262.50 |
| Northwind Traders Fruit Cocktail | £1,560.00 |
| Northwind Traders Gnocchi | £380.00 |
| Northwind Traders Green Tea | £822.25 |
| Northwind Traders Long Grain Rice | £280.00 |
| Northwind Traders Marmalade | £2,340.00 |

18. Save the query as QryCalculate2 and close the query

Parameter Queries

When running a query, you may not know what criteria to put in at the time or you may want to put in different criteria at different times your needs for the query may change.

In this situation, you can place a holder in the criteria field in lieu of the actual criteria. This is called a parameter query. When the query is actually run, the criteria will then be requested. The primary advantage of using a parameter query lies in being able to use the same query for many different possibilities of criteria, such as shifting dates or different product lines.

Single Textual Parameter

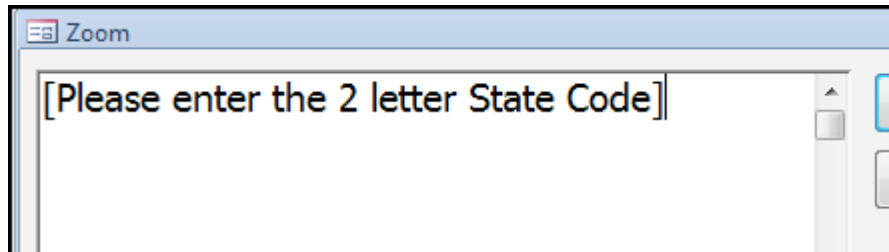
All of the criteria we have used so far can be used when building a parameter query the only difference is, is that the actual values you would enter into the criteria (not the operators) would be entered when the parameter query is actually run.

► To create a single parameter

MOUSE

1. Create a query in design view.
2. Add the Customers table to the grid.
3. Close the **SHOW TABLE** dialog
4. Add the first name, last name and state/province fields to the grid

5. Sort the state/province field ascending.
6. Run the query and check the data.
7. Return to design view
8. In the **CRITERIA** section of the state/province field open the **ZOOM** window (**SHIFT +F2**)
9. In the zoom window enter the following syntax.



Click **OK** and press **RETURN** for access to accept the parameter.

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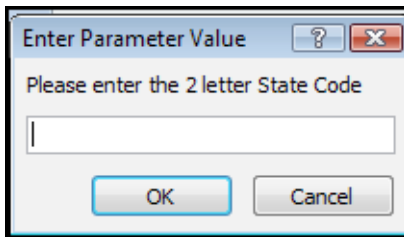


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Run the query you should be presented with a small dialog asking you for your criteria enter **CA** and click **OK**



| First Name | Last Name | State/Provir |
|------------|-------------|--------------|
| Thomas | Axen | CA |
| Daniel | Goldschmidt | CA |
| Alexander | Eggerer | CA |
| * | | |

10. The data should then appear showing records that match your criteria.
11. Try it several times with different criteria.
12. Save the query as QryPara1 and close the query.

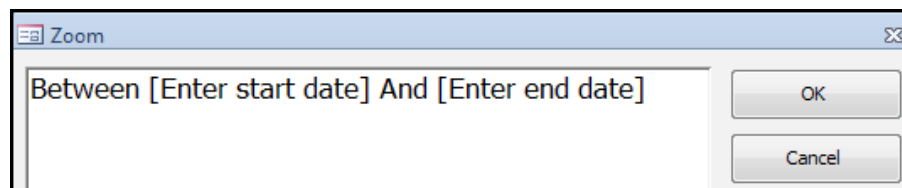
Parameters with 2 conditions

We will now attempt a parameter query with more than one condition its basically the same but we will use operators like we did for select queries the only difference is that instead of the criteria in the expression we will use parameter questions.

► To create a query with 2 parameter conditions.

MOUSE

1. Create a query in design view
2. Add the Orders and Customers tables to the grid
3. Close the **SHOW TABLE** dialogue.
4. Form the Customers table add the Company field
5. From the orders table add the Order Date field
6. Sort the company field **ASCENDING**.
7. In the **CRITERIA** section of the order date field open the **ZOOM** window (**SHIFT + F2**).
8. Enter the following Syntax.



9. As you can see there are two parameter conditions to enter now to return a range of dates.
10. Close the zoom window and press return for access to accept the criteria.

| Company | Order Date |
|------------|------------|
| Company A | 24/05/2006 |
| Company BB | 11/05/2006 |
| Company F | 09/05/2006 |
| Company G | 24/05/2006 |
| Company H | 24/05/2006 |
| Company J | 24/05/2006 |
| Company J | 24/05/2006 |
| Company K | 24/05/2006 |
| * | |

11. Save the query as QryPara2.
12. Run the query enter dates for May 2006
13. When the first dialog appears enter the start day for May press return or click **OK**.
14. When the second dialogue appears enter the end date for May and close the dialogue.
15. The records returned should be as shown.

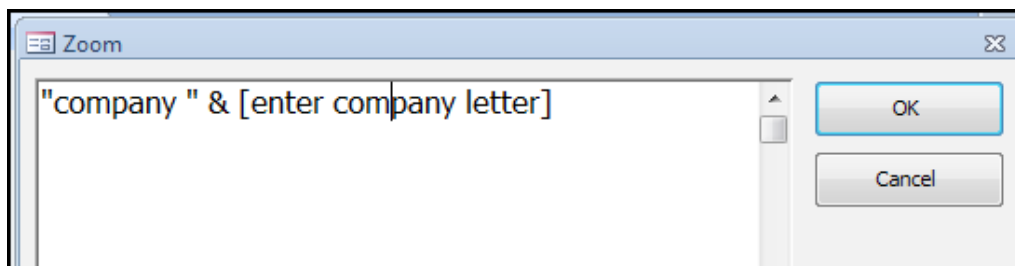
Multiple Parameters

Some queries may need more than one parameter across more than one field since each parameter will ask a different question we just need to ask the right questions. We will use the same query as above and put a second parameter on the company field since we don't want to have to keep typing in the word company we will have to be creative with the syntax using what we already know.

► To create a query with multiple parameters

MOUSE

1. In the query QryPara2 go to design view
2. In the design grid click in the criteria section of the company field.
3. Open the zoom window and enter the following syntax



Remember we do not want to keep entering the text “company” so we will have to join that or concatenate it to the value we will enter in the parameter remember there is a space after the word company and we must include that in the speech marks after the word company. The ampersand (&) is the operator to concatenate text.

4. When the syntax has been entered close the zoom window and press return for access to accept the syntax.

| Company | Order Date |
|-----------|------------|
| Company J | 24/05/2006 |
| Company J | 24/05/2006 |

5. Run the query you now have three values to enter for the company letter enter the letter “J”. and for the dates enter the month of May again as before the records should show as follows.
6. Now we know what company J has purchased in May
 - By using the like operator along with one or more wildcards in a parameter query, you can quickly and easily display query results from “inexact” criteria, that is, part of the field’s contents, or a common pattern.

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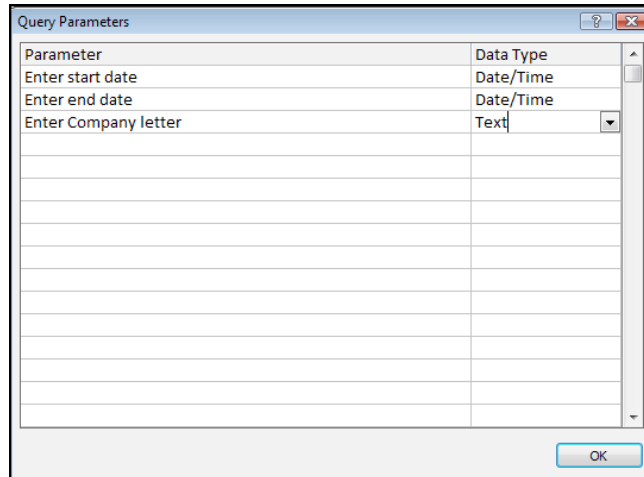
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Control The Parameter Order

To change the order in which **ENTER PARAMETER VALUE** dialogue boxes are displayed, use the **PARAMETERS** dialogue box.

- To display the query parameters dialog box, the parameters button from the show/hide group.



- In the parameter column, enter each of the parameters in the order required to run (you don't need to put the square brackets around them.)
- In the data type column, select from the value list the type of data to be entered.
- Any parameter that is entered into the query design grid but not entered into the query parameters dialog box is displayed after the last parameter in the query parameters dialog box has been displayed.

Other Parameter Criteria Options

We could use the **LIKE** criteria on fields with long strings of text like data from the products table for example.

Like[enter first name of product]&"*"

Like"*"&[enter last name of product]

Like"*"&[enter any part of product name]&"*"

Crosstab Query

What Is A Crosstab Query

A crosstab query is a query that calculates a sum, average, count, or other type of total on records, and then groups the result by two types of information: one down the left side of the datasheet and the other across the top. A little like a Pivot table.

Creating a Crosstab

Now suppose that you want to review product subtotals, but you also want to aggregate by month, so that each row shows subtotals for a product, and each column shows product subtotals for a month. To show subtotals for a product and to show product subtotals for a month, use a crosstab query

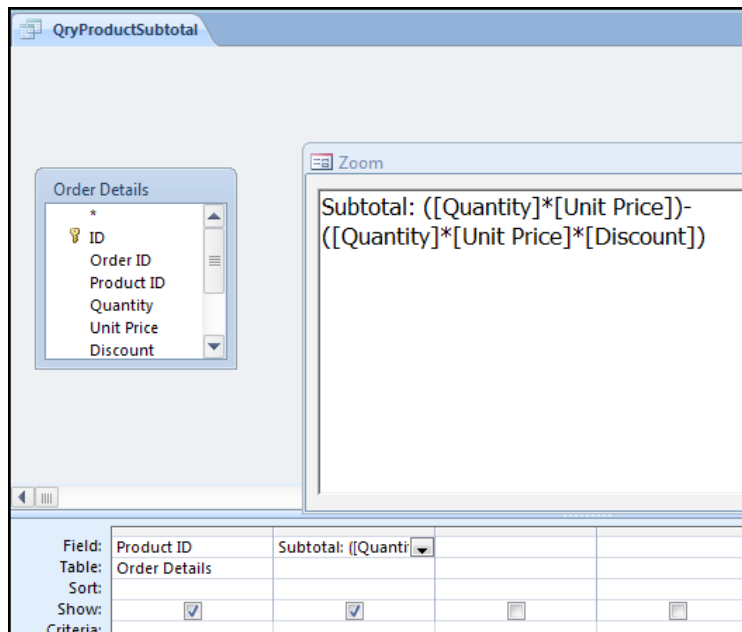
We will compound previous lessons and build a calculation, format, save, aggregate totals AND create a crosstab all in one Query

- You cannot create a Web query that is a crosstab query.

► To create a Calculation

mouse

- On the **CREATE** tab, in the **QUERIES** group, click **QUERY DESIGN**.
- In the **SHOW TABLE** dialog box, on the **TABLES** tab, double-click **ORDER DETAILS**.
- Close the **SHOW TABLE** dialog box.
- In the Order Details table, double-click **PRODUCT ID** to add this field to the first column of the query design grid.
- In the second column of the grid, right-click the **FIELD** row, and then open the **ZOOM** window.(**SHIFT+F2**)



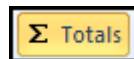
- In the **ZOOM** box, type the following:
Subtotal: ([Quantity]*[Unit Price]) - ([Quantity]*[Unit Price]*[Discount])

| Property Sheet | |
|----------------------------------|----------|
| Selection type: Field Properties | |
| General Lookup | |
| Description | |
| Format | Currency |
| Decimal Places | 2 |
| Input Mask | |
| Caption | |
| Smart Tags | |

7. Close the **ZOOM** window
8. While in the subtotal field Show the **PROPERTY SHEET**
9. Set the **FORMAT** to currency and 2 **DECIMAL PLACES**.
10. Sort the product ID **ASCENDING**
11. **SAVE** the query as QryProductSubtotal
12. **RUN** the Query to see the subtotals

► To show totals in datasheet view

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1. While in datasheet view in the **HOME** ribbon, **RECORDS** group, click **TOTALS**.
 - A new row appears at the bottom of the datasheet, with the word **TOTAL** in the first column.
2. Click the cell in the last row of the datasheet named **TOTAL** under the product Id field

| | |
|--------------------------|-----------|
| Northwind Traders Chai | £450.00 |
| Northwind Traders Coffee | £1,150.00 |
| ▼ | Total |

Record: 1 | Totals | No Filter | Search

- Note that an arrow appears in the cell.
3. Click the arrow to view the available aggregate functions.
 - Because the column contains text data, there are only two choices: *None* and *Count*.
 4. Select **COUNT**.
 - The content of the cell changes from **TOTAL** to a count of the column values.

| | |
|--------------------------|-----------|
| Northwind Traders Chai | £450.00 |
| Northwind Traders Coffee | £1,150.00 |
| 58 ▼ | |

Record: 1 | Totals | No Filter | Search

5. Click the adjoining cell under the subtotals (the second column).
 - Note that an arrow appears in the cell.
6. Click the arrow, and then click **SUM**.
 - The field displays a sum of the column values.

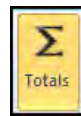
| | |
|--------------------------|------------|
| Northwind Traders Coffee | £1,150.00 |
| 58 ▼ | £68,137.00 |

Record: 1 | Totals | No Filter | Search

7. Go back to **DESIGN** view

► To create aggregate function

MOUSE



1. On the **DESIGN** tab, in the **SHOW/HIDE** group, click **TOTALS**.
2. The **TOTALS** row is displayed in the query design grid.
 - Although they have similar names, the **TOTALS** row in the design grid and the **TOTAL** row in a datasheet are not the same:

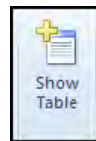
| | | |
|-----------|-------------------------------------|-------------------------------------|
| Field: | Product ID | Subtotal: ([Quanti |
| Table: | Order Details | |
| Total: | Group By | Sum |
| Sort: | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | | |

3. In the second column of the design grid (Subtotals), in the **TOTAL** row, select **SUM** from the drop-down list.
4. Save the query and run it.
5. The products have aggregated and now the subtotals column shows those aggregated totals.
6. Return to **DESIGN** View

| Product | Subtotal |
|--|------------|
| Northwind Traders Chai | £720.00 |
| Northwind Traders Syrup | £500.00 |
| Northwind Traders Cajun Seasoning | £880.00 |
| Northwind Traders Olive Oil | £533.75 |
| Northwind Traders Boysenberry Spread | £2,500.00 |
| Northwind Traders Dried Pears | £1,200.00 |
| Northwind Traders Curry Sauce | £2,600.00 |
| Northwind Traders Fruit Cocktail | £1,560.00 |
| Northwind Traders Chocolate Biscuits Mix | £782.00 |
| Northwind Traders Marmalade | £3,240.00 |
| Northwind Traders Scones | £200.00 |
| Northwind Traders Beer | £6,818.00 |
| Northwind Traders Crab Meat | £2,208.00 |
| Northwind Traders Clam Chowder | £2,798.50 |
| Northwind Traders Coffee | £29,900.00 |
| Northwind Traders Chocolate | £2,550.00 |
| Northwind Traders Dried Apples | £2,120.00 |
| Northwind Traders Long Grain Rice | £280.00 |
| Northwind Traders Gnocchi | £380.00 |
| Northwind Traders Ravioli | £1,950.00 |
| Northwind Traders Mozzarella | £3,132.00 |
| Northwind Traders Almonds | £200.00 |
| Northwind Traders Dried Plums | £262.50 |
| 24 | £68,137.00 |

► To create a crosstab

MOUSE



1. In the **QUERY SETUP** group, click **SHOW TABLE**.
2. In the **SHOW TABLE** dialog box, double-click **ORDERS**, to add this table to the design grid then click **CLOSE**.



3. On the **DESIGN** tab, in the **QUERY TYPE** group, click **CROSSTAB**.
4. In the design grid, the **SHOW** row is hidden, and the **CROSSTAB** row is displayed.

| | | | |
|------------------|---------------|------------------------|-------------------|
| Field: | Product ID | Subtotal: ([Quantity]* | Month: "Month " ▾ |
| Table: | Order Details | | |
| Total: | Group By | Sum | Group By |
| Crosstab: | | | |
| Sort: | | | |
| Criteria: | | | |
| or: | | | |

5. In the third column of the design grid, right-click the **FIELD** row, and then click **ZOOM** on the shortcut menu. The **ZOOM** box opens.
6. In the **ZOOM** box, type the following:

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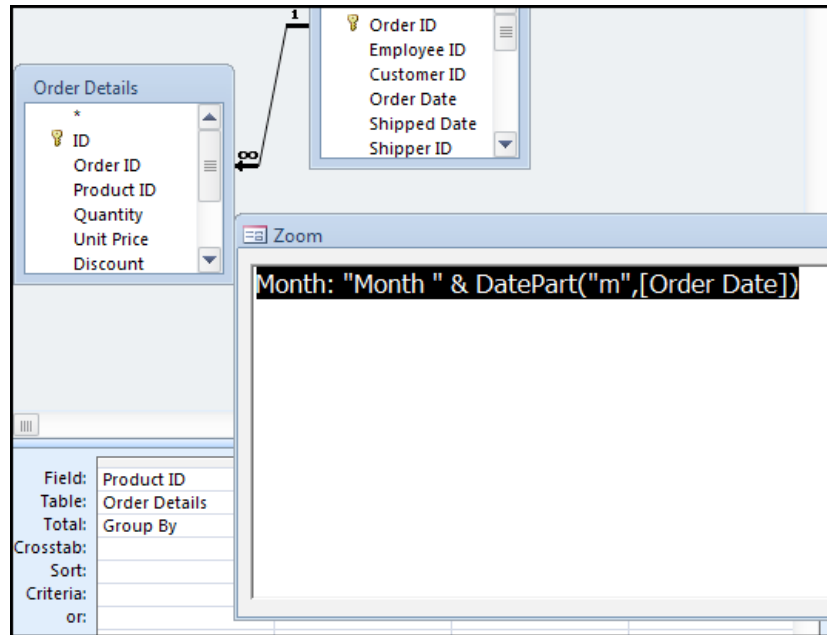
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Month: "Month " & DatePart("m", [Order Date])

| | | | |
|-----------|---------------|------------------------|---------------------|
| Field: | Product ID | Subtotal: ([Quantity]* | Month: "Month " & D |
| Table: | Order Details | | |
| Total: | Group By | Sum | Group By |
| Crosstab: | Row Heading | Value | Column Heading |
| Sort: | | | |
| Criteria: | | | |
| or: | | | |

7. Click **OK** to close the **ZOOM** Box
8. In the **CROSSTAB** row, select the following values from the drop-down list:
9. **ROW HEADING** for the first column,
10. **VALUE** for the second column,
11. **COLUMN HEADING** for the third column.
12. On the **DESIGN** tab, in the **RESULTS** group, click **RUN**.
13. The query runs, and then displays product subtotals, aggregated by month.

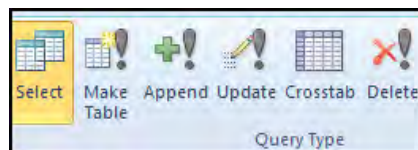
| Product | Month 1 | Month 2 | Month 3 | Month 4 | Month 5 | Month 6 |
|--|-----------|-----------|------------|-----------|---------|-----------|
| Northwind Traders Chai | £270.00 | | £450.00 | | | |
| Northwind Traders Syrup | | | | £500.00 | | |
| Northwind Traders Cajun Seasoning | | | £220.00 | | | £660.00 |
| Northwind Traders Olive Oil | | | | £533.75 | | |
| Northwind Traders Boysenberry Spread | | | £250.00 | | | £2,250.00 |
| Northwind Traders Dried Pears | £300.00 | | | | | £900.00 |
| Northwind Traders Curry Sauce | | | £680.00 | £1,120.00 | £800.00 | |
| Northwind Traders Fruit Cocktail | | | | | | £1,560.00 |
| Northwind Traders Chocolate Biscuits Mix | £276.00 | £184.00 | £92.00 | £230.00 | | |
| Northwind Traders Marmalade | | | | £3,240.00 | | |
| Northwind Traders Scones | | | | £200.00 | | |
| Northwind Traders Beer | £1,400.00 | | | £5,418.00 | | |
| Northwind Traders Crab Meat | | | | £1,472.00 | £736.00 | |
| Northwind Traders Clam Chowder | | £1,930.00 | | £772.00 | | £96.50 |
| Northwind Traders Coffee | £920.00 | | £28,750.00 | | | £230.00 |
| Northwind Traders Chocolate | | £127.50 | £1,275.00 | £127.50 | | £1,020.00 |
| Northwind Traders Dried Apples | £530.00 | | | | | £1,590.00 |
| Northwind Traders Long Grain Rice | | | | £280.00 | | |
| Northwind Traders Gnocchi | | | | £380.00 | | |
| Northwind Traders Ravioli | | | | £1,950.00 | | |
| Northwind Traders Mozzarella | | | | £3,132.00 | | |
| Northwind Traders Almonds | | | | | £200.00 | |

14. Press CTRL+S to save the query and close.

Action Queries

Be warned that if you try to run an action query on a table which is opened by several users then the query will fail due to locking errors.

Action queries allow the user to quickly and easily make changes to the data and transfer it between tables. There are four types they are:



Update query

Append query

Delete query

Make table query

Before running an action query you can view the records that will be affected by the query by looking at the query in datasheet view. Before making a selection as to the type of query you may want to use

In the use of the Action Queries we will continue to use the northwind database.

Make table Query

You can use a make-table query to create a new table from data that is stored in other tables.

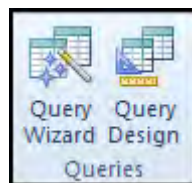
For example, suppose that you want to send data for Chicago orders to a Chicago business partner who uses Access to prepare reports. Instead of sending all your order data, you want to restrict the data that you send to data specific to Chicago orders.

You can build a select query that contains Chicago order data, and then use the select query to create the new table by using the following procedure:

- To run a make-table query, you may need to enable the database content by using the Message Bar, which appears beneath the Ribbon if the database is untrusted when you open it.
- If your database is in a trusted location, the Message Bar does not appear and enabling the content is unnecessary.

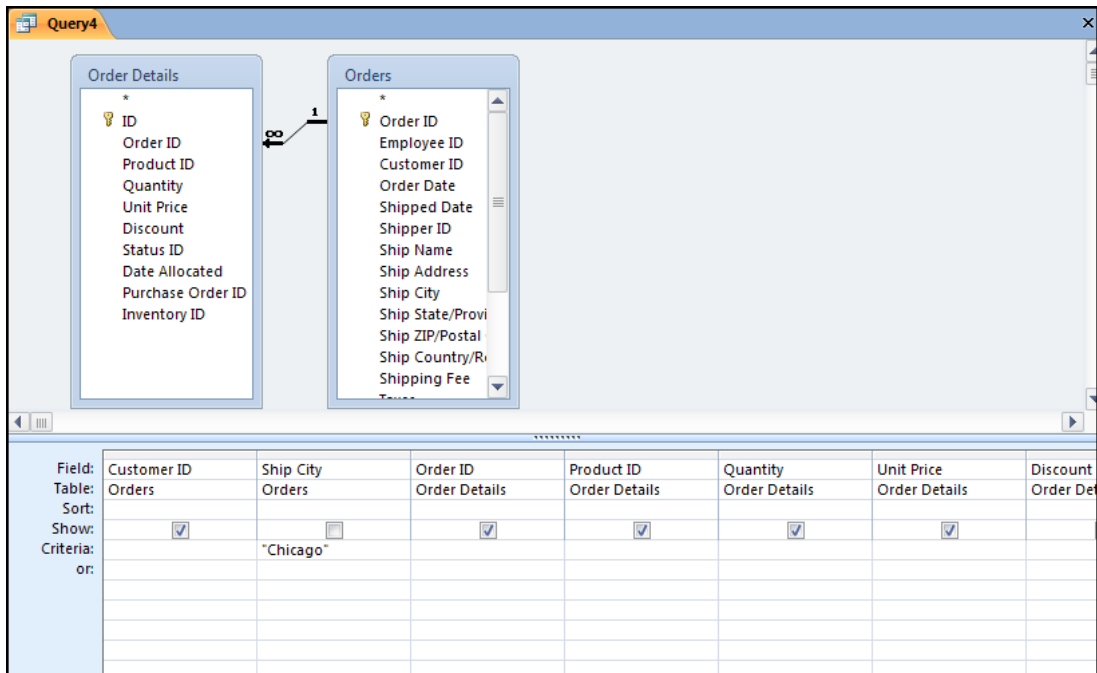
► To create and run a make table query.

MOUSE



1. On the **CREATE** tab, in the **QUERIES** group, click **QUERY DESIGN**.
2. In the **SHOW TABLE** dialog box, double-click **ORDER DETAILS** and **ORDERS**.
3. Close the **SHOW TABLE** dialog box.
4. In the **ORDERS** table, double-click **CUSTOMER ID** and **SHIP CITY** to add these fields to the design grid.
5. In the **ORDER DETAILS** table, double-click **ORDER ID**, **PRODUCT ID**, **QUANTITY**, **UNIT PRICE**, and **DISCOUNT** to add these fields to the design grid.

6. In the **SHIP CITY** column of the design grid, clear the box in the **SHOW** row.
7. See next page for the design Layout.



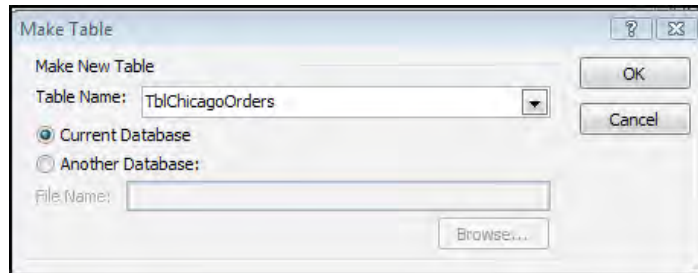
8. In the **CRITERIA** row, type **CHICAGO** in speech marks
9. Verify the query results before you use them to create the table.

| Customer | Order ID | Product | Quantity | Unit Price | Discount |
|-----------|----------|--|----------|------------|----------|
| Company J | 40 | Northwind Traders Green Tea | 200 | £2.99 | 0.00% |
| Company J | 42 | Northwind Traders Boysenberry Spread | 10 | £25.00 | 0.00% |
| Company J | 42 | Northwind Traders Cajun Seasoning | 10 | £22.00 | 0.00% |
| Company J | 42 | Northwind Traders Chocolate Biscuits Mix | 10 | £9.20 | 0.00% |
| Company Y | 50 | Northwind Traders Scones | 20 | £10.00 | 0.00% |
| Company J | 67 | Northwind Traders Almonds | 20 | £10.00 | 0.00% |
| Company J | 69 | Northwind Traders Dried Plums | 15 | £3.50 | 0.00% |
| Company Y | 76 | Northwind Traders Cajun Seasoning | 30 | £22.00 | 0.00% |

10. On the **DESIGN** tab, in the **RESULTS** group, click **RUN**.
11. Press **CTRL+S** to save the query as **QryChicagoOrders**,
12. Click **OK** to close the dialogue
13. Return to **DESIGN VIEW**.
14. On the **DESIGN** tab, in the **QUERY TYPE** group, click **MAKE TABLE**.



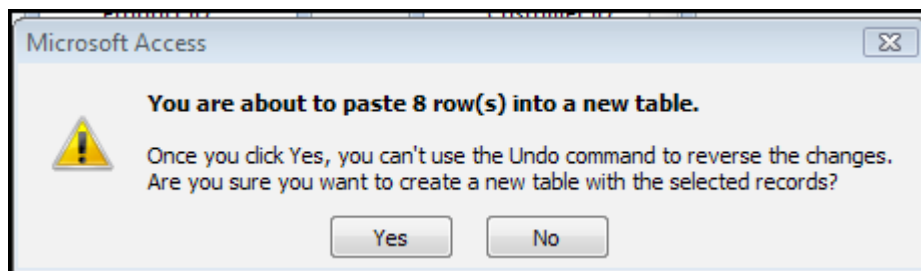
15. The MAKE TABLE dialog box appears.



16. In the MAKE TABLE dialog box, in the TABLE NAME box, type TblChicagoOrders, and then click OK.

17. On the DESIGN tab, in the RESULTS group, click RUN.

18. In the confirmation dialogue box, click YES to confirm.

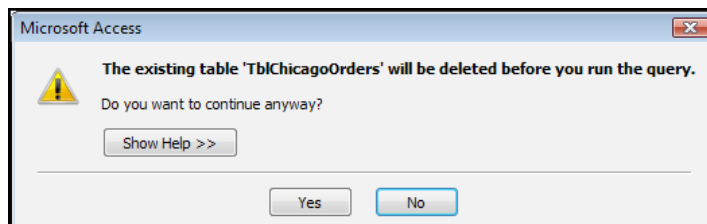


19. The new table is created, and the table appears in the Navigation Pane.

- If there is already a table that has the name that you specified, that table is deleted before the query runs.

1. On the DESIGN tab, in the RESULTS group, click RUN again

2. Because the TblChicagoOrders table exists, a warning dialog box appears.



3. Click **NO** to cancel the action and to dismiss the dialog box.

Append Query

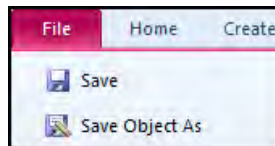
An append query is similar to the make table query except the results are appended to an existing table

You can use an append query to retrieve data from one or more tables and add that data to another table.

Suppose that you created a table to share with a Chicago business associate, but you realize that the associate also works with clients in the Milwaukee area. You want to add rows that contain Milwaukee area data to the table before you share the table with your associate.

► To create and use an append query

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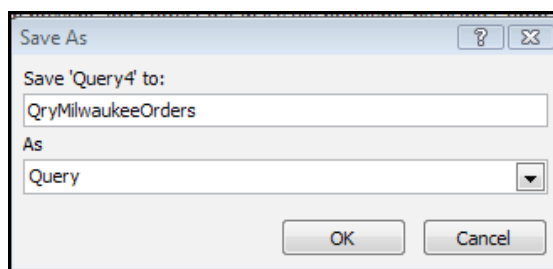


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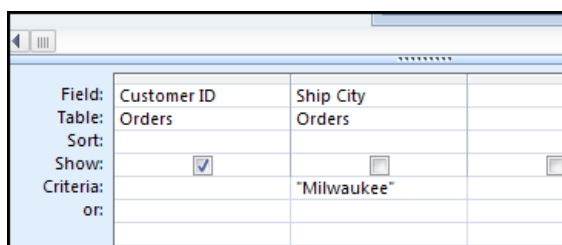


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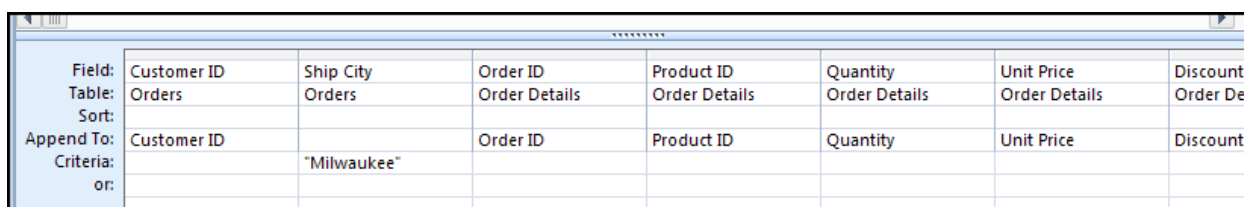
1. Open the query named “QryChicagoOrders” in Design view.
2. Go to the **FILE** tab and select **SAVE OBJECT AS**
3. In the dialogue enter the name “QryMilwaukeeOrders” and click **OK**



4. In the design grid, in the **CRITERIA** row of the Ship City column, delete ‘CHICAGO’; and then type ‘MILWAUKEE’.

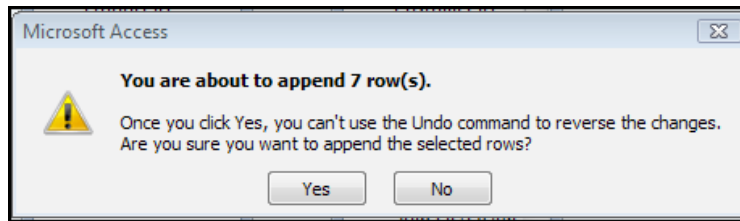


5. On the **DESIGN** tab, in the **QUERY TYPE** group, click **APPEND**. The **APPEND** dialog box opens.
6. In the **APPEND** dialog box, click the arrow in the **TABLE NAME** box, and then select TblChicagoOrders from the drop-down list.
7. Click **OK**.
8. The **APPEND** dialog box closes. In the design grid, the **SHOW** row disappears, and the **APPEND TO** row appears.



9. In the **APPEND TO** row, select the appropriate field for each column that you wish to append to.
10. In this example, the **APPEND TO** row values should match the **FIELD** row values, but that is not required for append queries to work.
11. On the **DESIGN** tab, in the **RESULTS** group, click **RUN**.

12. A dialogue will appear confirming the append procedure.



13. Click YES

14. Save the changes to the Query and close.

15. Open TblChicagoOrders to see the appended data

- Please remember this appended data shows the Customer ID and the Product ID and the table would need to be related to the customers table and the products table to match the ID's with the correct information.
OR Have it updated using an **UPDATE** Query

| Customer ID | Order ID | Product ID | Quantity | Unit Price | Discount |
|-------------|----------|------------|----------|------------|----------|
| 10 | 40 | 81 | 200 | £2.99 | 0 |
| 10 | 42 | 6 | 10 | £25.00 | 0 |
| 10 | 42 | 4 | 10 | £22.00 | 0 |
| 10 | 42 | 19 | 10 | £9.20 | 0 |
| 25 | 50 | 21 | 20 | £10.00 | 0 |
| 10 | 67 | 74 | 20 | £10.00 | 0 |
| 10 | 69 | 80 | 15 | £3.50 | 0 |
| 25 | 76 | 4 | 30 | £22.00 | 0 |
| 6 | 37 | 8 | 17 | £40.00 | 0 |
| 6 | 47 | 34 | 300 | £14.00 | 0 |
| 6 | 56 | 48 | 10 | £12.75 | 0 |
| 6 | | | | | |
| 6 | 74 | 48 | 40 | £12.75 | 0 |
| 6 | 79 | 7 | 30 | £30.00 | 0 |
| 6 | 79 | 51 | 30 | £53.00 | 0 |
| * | | | | | |

Update Query

You can use an update query to change the data in your tables, and you can use an update query to enter criteria to specify which rows should be updated. An update query provides you an opportunity to review the updated data before you perform the update.

- An action query cannot be undone. You should consider making a backup of any tables that you will update by using an update query.

In the previous example, you appended rows to the TblChicagoOrders table. In the TblChicagoOrders table, the Product ID field shows the numeric Product ID. To make the data more useful for reports, you may want to replace the product IDs with product names. To replace the product IDs, you must first change the data type of the Product ID field of the Chicago Orders table from Number to Text, so that the Product ID field can accept product names.

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► To change Datatype in the table

MOUSE

1. Open the TblChicagoOrders table in Design View
2. Change the product ID to the text data type and the field size (properties) to 100

| Field Name | Data Type |
|-------------|-----------|
| Customer ID | Number |
| Order ID | Number |
| Product ID | Text |
| Quantity | Number |
| Unit Price | Currency |
| Discount | Number |

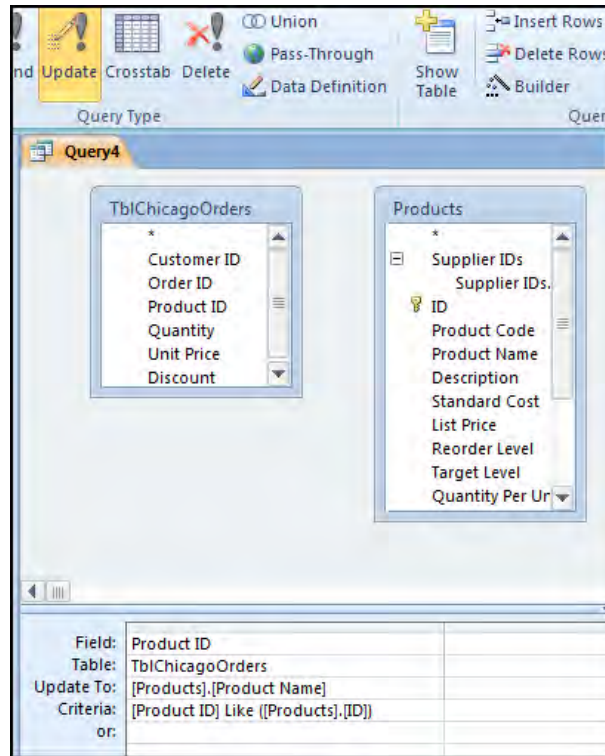
| General | |
|------------|-----|
| Field Size | 100 |
| Format | |
| Input Mask | |

3. Save and close the Table

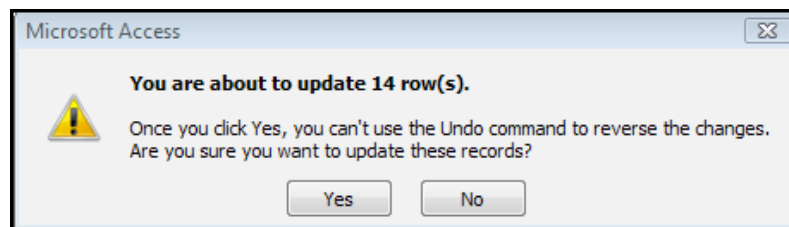
► To update the values in the TblChicagoOrders

MOUSE

1. On the **CREATE** tab, in the **QUERIES** group, click **QUERY DESIGN**.
2. In the **SHOW TABLE** dialog box, double-click “TblChicagoOrders” and “Products”.
3. Close the **SHOW TABLE** dialog box.
4. On the **DESIGN** tab, in the **QUERY TYPE** group, click **UPDATE**.
 - In the design grid, the **SORT** and **SHOW** rows disappear, and the **UPDATE TO** row appears.
5. In the TblChicagoOrders table, double-click **PRODUCT ID** to add this field to the design grid.
6. In the design grid, in the **UPDATE TO** row of the **PRODUCT ID** column, type the following:
 - **[Products].[Product Name]**
 - You can use an update query to delete field values by using an empty string (“”) or NULL in the **Update To** row.



7. In the Criteria row, type or paste the following:
[Product ID] Like ([Products].[ID])
 - The **LIKE** keyword is necessary because the fields that you are comparing contain different data types (Product ID is text data, ID is numeric data).
8. You can review which values will be changed by an update query by viewing the query in Datasheet **VIEW**. On the **DESIGN** tab, in the **RESULTS** group, click **VIEW**, and then click **DATASHEET** View.
9. The query returns a list of Product IDs that will be updated.
10. On the **DESIGN** tab, in the **RESULTS** group, click **RUN**. A dialog will appear confirming the update.



11. Save the Query as QryUpdateProductID and close the query
12. Open the TblChicagoOrders table, you will see that the numeric values in the Product ID field have been replaced by the product names from the Products table.

13. Adjust column widths where necessary and save the changes to the table.

| Customer ID | Order ID | Product ID | Quantity | Unit Price | Discount |
|-------------|----------|--|----------|------------|----------|
| 10 | 40 | Northwind Traders Green Tea | 200 | £2.99 | 0 |
| 10 | 42 | Northwind Traders Boysenberry Spread | 10 | £25.00 | 0 |
| 10 | 42 | Northwind Traders Cajun Seasoning | 10 | £22.00 | 0 |
| 10 | 42 | Northwind Traders Chocolate Biscuits Mix | 10 | £9.20 | 0 |
| 25 | 50 | Northwind Traders Scones | 20 | £10.00 | 0 |
| 10 | 67 | Northwind Traders Almonds | 20 | £10.00 | 0 |
| 10 | 69 | Northwind Traders Dried Plums | 15 | £3.50 | 0 |
| 25 | 76 | Northwind Traders Cajun Seasoning | 30 | £22.00 | 0 |
| 6 | 37 | Northwind Traders Curry Sauce | 17 | £40.00 | 0 |
| 6 | 47 | Northwind Traders Beer | 300 | £14.00 | 0 |
| 6 | 56 | Northwind Traders Chocolate | 10 | £12.75 | 0 |
| 6 | | | | | |
| 6 | 74 | Northwind Traders Chocolate | 40 | £12.75 | 0 |
| 6 | 79 | Northwind Traders Dried Pears | 30 | £30.00 | 0 |
| 6 | 79 | Northwind Traders Dried Apples | 30 | £53.00 | 0 |
| * | | | | | |

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Delete Query

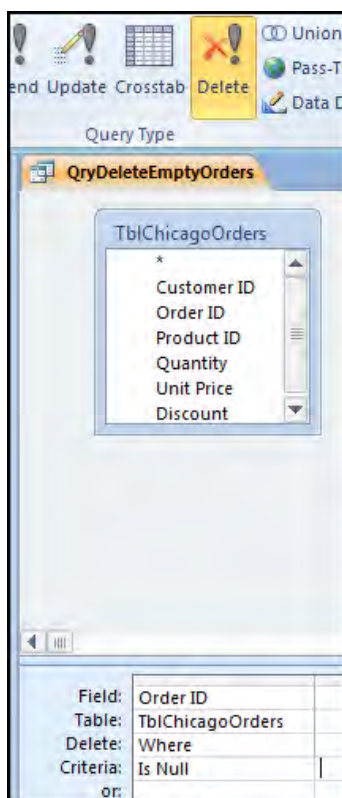
You can use a delete query to delete data from your tables, and you can use a delete query to enter criteria to specify which rows should be deleted. A delete query provides you an opportunity to review the rows that will be deleted before you perform the deletion.

Suppose that you are preparing to send the “TblChicagoOrders” table to your Chicago business associate, and you notice that some of the rows contain a number of empty fields. You would like to remove these rows that contain empty fields before you send the table. You could just open the table and delete the rows manually, but you might find it helpful to use a delete query if there are more than a few rows that you want to delete and you have clear criteria for which rows should be deleted.

You can use a query to delete rows in the Chicago Orders table that do not have a value for Order ID by using the following procedure:

► To delete records

MOUSE

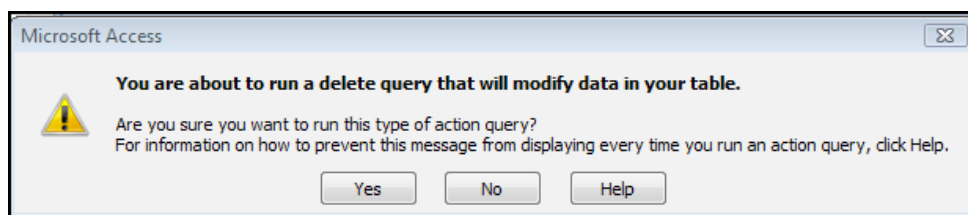


1. On the **CREATE** tab, in the **QUERIES** group, click **QUERY DESIGN**.
2. In the **SHOW TABLE** dialog box, double-click TblChicagoOrders.
3. Close the **SHOW TABLE** dialog box.

4. In the TblChicagoOrders table, double-click **ORDER ID** to add it to the grid.
5. In the design grid, in the **CRITERIA** row of the Order ID column, type **IS NULL**.
6. Click view datasheet to see which records will be deleted
7. Return to design view
8. Save the query as QryDeleteEmptyOrders
9. On the **DESIGN** tab, in the **QUERY TYPE** group, click **DELETE**.

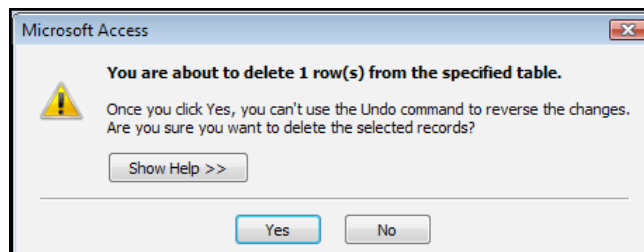
In the design grid, the **SORT** and **SHOW** rows disappear, and the **DELETE** row appears.

10. On the **DESIGN TAB**, in the **RESULTS** group, click **RUN**.
11. A dialog will appear confirming the running of this query.



12. Click **YES** and another dialog will appear informing you of what is about to happen.


- Remember since deleting a record cannot be undone these dialogs give you every chance to change your mind.



13. Click **YES** to confirm the deletion
14. Open the Table TblChicagoOrders to see that the records have been deleted

| Customer ID | Order ID | Product ID | Quantity | Unit Price | Discount |
|-------------|----------|--|----------|------------|----------|
| 10 | 40 | Northwind Traders Green Tea | 200 | £2.99 | 0 |
| 10 | 42 | Northwind Traders Boysenberry Spread | 10 | £25.00 | 0 |
| 10 | 42 | Northwind Traders Cajun Seasoning | 10 | £22.00 | 0 |
| 10 | 42 | Northwind Traders Chocolate Biscuits Mix | 10 | £9.20 | 0 |
| 25 | 50 | Northwind Traders Scones | 20 | £10.00 | 0 |
| 10 | 67 | Northwind Traders Almonds | 20 | £10.00 | 0 |
| 10 | 69 | Northwind Traders Dried Plums | 15 | £3.50 | 0 |
| 25 | 76 | Northwind Traders Cajun Seasoning | 30 | £22.00 | 0 |
| 6 | 37 | Northwind Traders Curry Sauce | 17 | £40.00 | 0 |
| 6 | 47 | Northwind Traders Beer | 300 | £14.00 | 0 |
| 6 | 56 | Northwind Traders Chocolate | 10 | £12.75 | 0 |
| 6 | 74 | Northwind Traders Chocolate | 40 | £12.75 | 0 |
| 6 | 79 | Northwind Traders Dried Pears | 30 | £30.00 | 0 |
| 6 | 79 | Northwind Traders Dried Apples | 30 | £53.00 | 0 |

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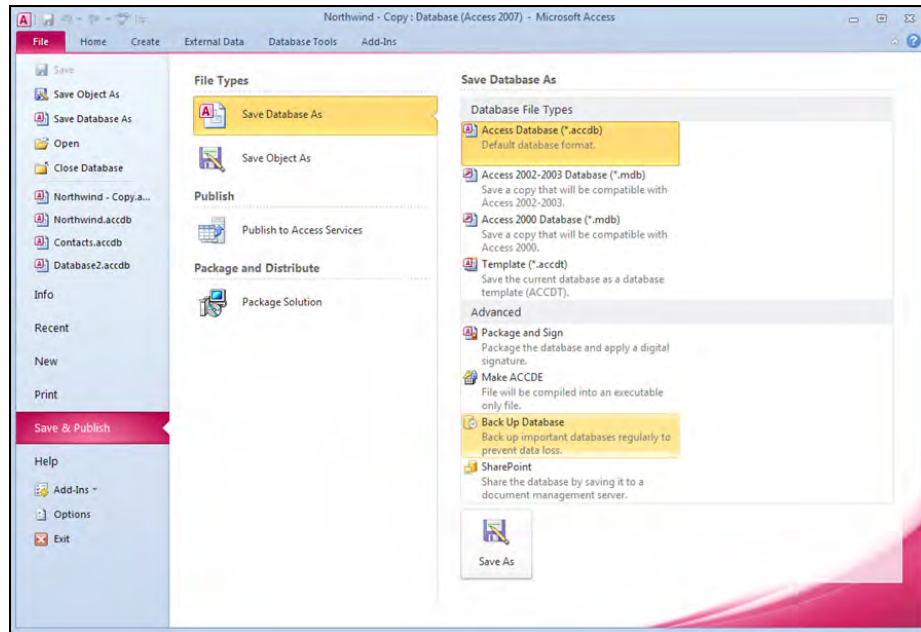
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Back Up Your Database

Back up your database before you delete records. You cannot reverse or undo a delete operation. The only way to recover deleted records is to restore them from a backup. A delete operation might also delete records in related tables, so it is best to back up the entire database before starting the operation.



► To Back up a database

MOUSE

1. Click on the **FILE** tab, go to **SAVE & PUBLISH** click **BACK UP DATABASE** and then click **SAVE AS**
 2. The **SAVE AS** dialog box appears, and Access appends the current date to the file name. Access creates the following type of file name: **NORTHWIND -_2010-04-29.ACCDB**.
 3. Accept the default name and location, or select another name or location, and then click **SAVE**.
 4. Access closes the original file, creates a backup, and then reopens the original file.
- To revert to a backup, close and rename the original file so that the backup copy can use the name of the original version. Assign the name of the original version to the backup copy, and open it in Access.
5. Now we may proceed with finding and deleting our duplicates.

Query to locate Unmatched Records

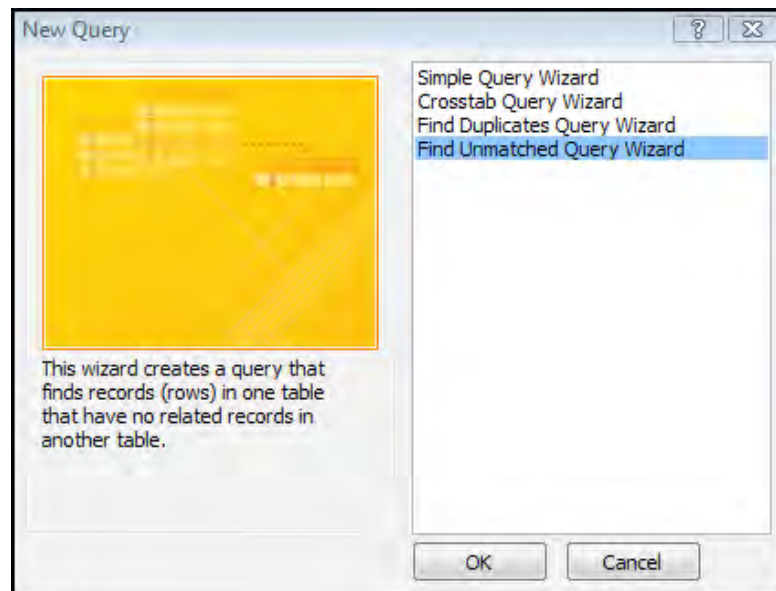
Sometimes you may want to compare two tables and identify records in one of the tables that have no corresponding records in the other table. The easiest way to identify these records is by using the Find Unmatched Query Wizard. After the wizard builds your query, you can modify the query's design to add or remove fields, or to add joins between the two tables (to indicate fields whose values should match). You can also create your own query to find unmatched records, without using the wizard.

We want to see a list of Northwind 2010 products that have never been sold,

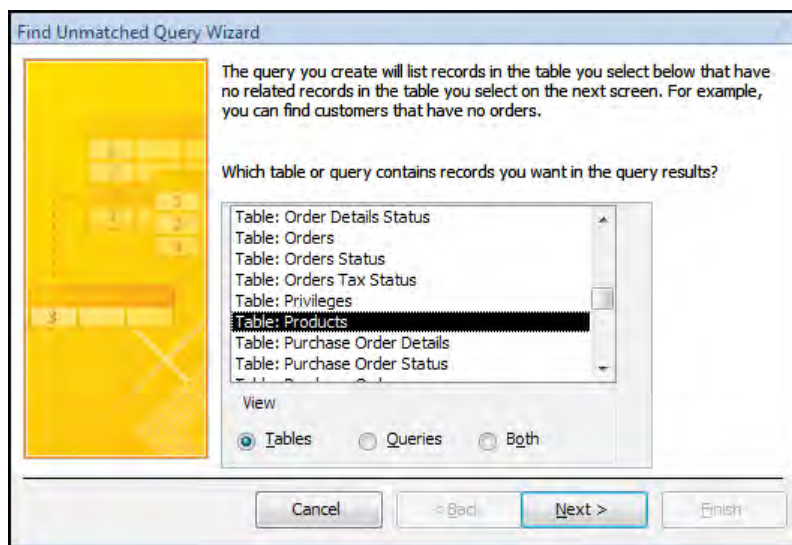
► To create an unmatched query with a wizard

MOUSE

1. On the **CREATE** tab, in the **QUERIES** group, click **QUERY WIZARD**.
2. In the **NEW QUERY** dialog box, double-click **FIND UNMATCHED QUERY WIZARD**.



3. On the first page of the wizard, select the table that has unmatched records, select the "Products" table and then click **NEXT**.



Try this...



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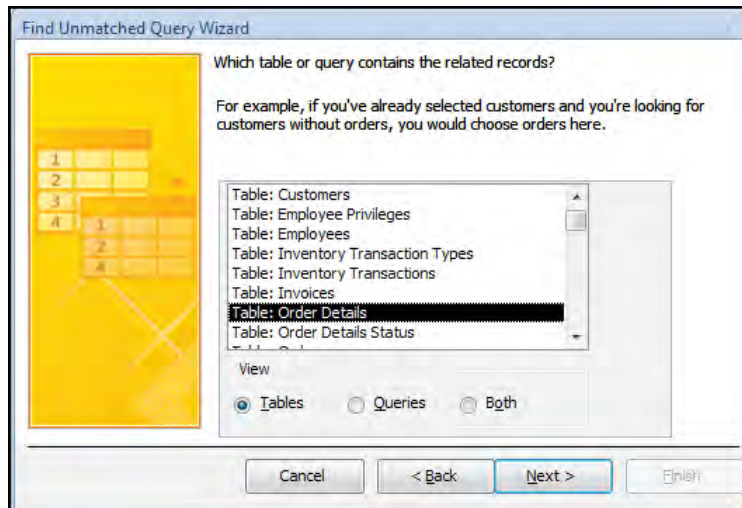
The sequence 2, 4, 6, 8, 10, 12, 14, 16, ... is the sequence of even whole numbers. The 100th place in this sequence is the number...?

Challenging? Not challenging? Try more >>

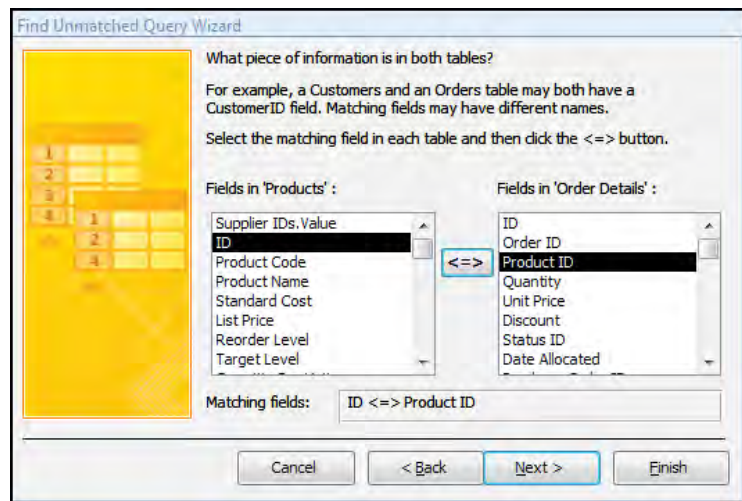
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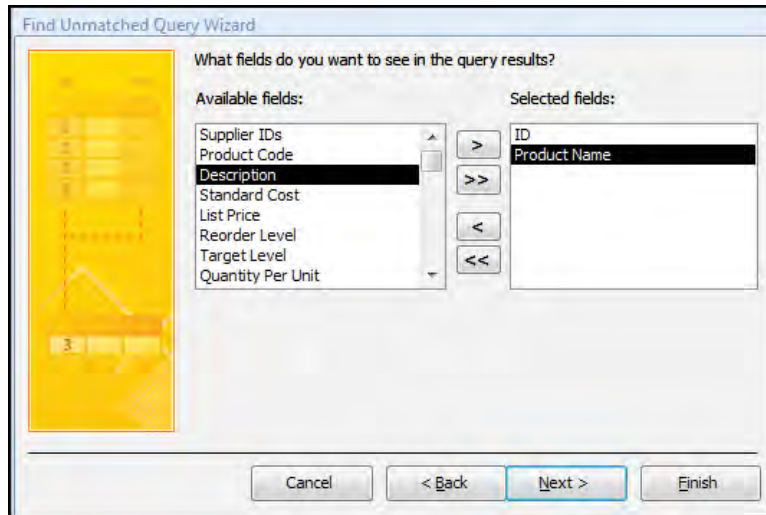
4. Select the table that is related, in our case the “Order Details” table and then click **NEXT**.



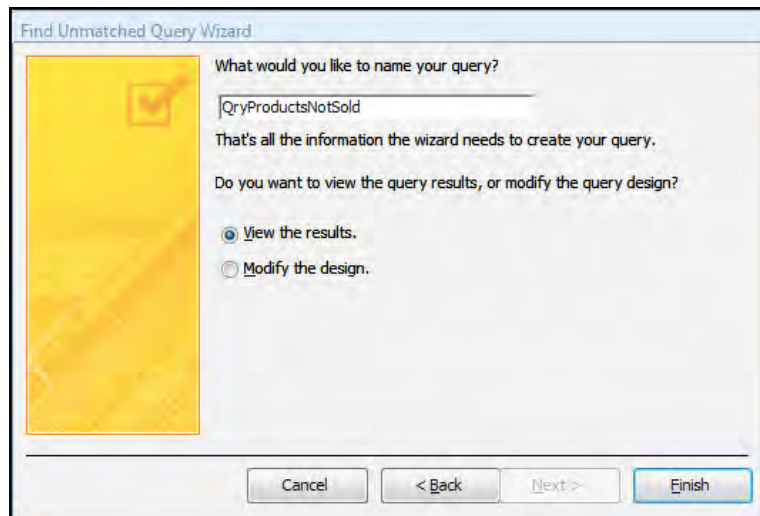
5. Select the fields that relate the tables, click **<=>**. Select “ID” from the “Products” table and “Product ID” from the “Order Details” table.



6. Verify that the correct fields are matched by checking the text in the **MATCHING FIELDS** box and then click **NEXT**.
- The ID and the Product ID fields may already be selected because of existing relationships built in to the template.
 - You can choose only one field from each table



7. Double-click the fields that you want to see from the first table, select the “ID” and “Product Name” fields and then click **NEXT**.
8. This page allows us to either view the results or to modify the design of our query, click **VIEW THE RESULTS**.



9. Name the query QryProductsNotSold, and then click **FINISH**.

| ID | Product Name |
|---------|--------------------------------------|
| 14 | Northwind Traders Walnuts |
| 65 | Northwind Traders Hot Pepper Sauce |
| 66 | Northwind Traders Tomato Sauce |
| 77 | Northwind Traders Mustard |
| 82 | Northwind Traders Granola |
| 83 | Northwind Traders Potato Chips |
| 85 | Northwind Traders Brownie Mix |
| 86 | Northwind Traders Cake Mix |
| 87 | Northwind Traders Tea |
| 88 | Northwind Traders Pears |
| 89 | Northwind Traders Peaches |
| 90 | Northwind Traders Pineapple |
| 91 | Northwind Traders Cherry Pie Filling |
| 92 | Northwind Traders Green Beans |
| 93 | Northwind Traders Corn |
| 94 | Northwind Traders Peas |
| 95 | Northwind Traders Tuna Fish |
| 96 | Northwind Traders Smoked Salmon |
| 97 | Northwind Traders Hot Cereal |
| 98 | Northwind Traders Vegetable Soup |
| 99 | Northwind Traders Chicken Soup |
| * ##### | |

10. You may want to modify your query's design to add other criteria, to change the sort order, or to add or to remove fields.

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Finding Duplicates Query

One of the primary reasons for using a relational database is to avoid duplicate data. However, as databases age, they often acquire duplicate values, especially when multiple users enter data. Typically, eliminating duplicate data saves money on storage and keeps your data more accurate. In turn, that accuracy can help you make better business decisions. For example, if you enter a sales order more than once, the customer might receive unneeded goods, and the redundancy can cost you money in increased shipping and accounting costs.

Before you take action to identify and delete duplicate records, remember that you need to rely on your knowledge of the data. Unlike the process of designing a database, you cannot follow a set of specific rules or procedures to find and delete duplicate records accurately. Remember one fact as you proceed: database queries can return what seem to be duplicate records, but in reality, those results are valid data. The apparent duplication usually happens when you do not include fields in the query that uniquely identify each record.

In some situations, such as when you look at data returned by a query, you might see what appear to be duplicate records, even though the underlying tables seem to contain only unique records. Problems can arise when your view does not include fields that uniquely identify a record

If you choose to delete your duplicate records, you must first deal with any existing table relationships. Typically, most databases use one-to-many relationships. For example, you might have a small number of customers, but each customer places many orders. As a result, the table of customer data resides on the “one” side of the relationship, and the order data resides on the “many” side of the relationship.

Remember this rule as you proceed: if the data that you want to delete resides on the “many” side of a relationship, you can delete data without taking additional steps. However, if the data resides on the “one” side, you must set a property in the relationship, or Access will prevent the deletion.

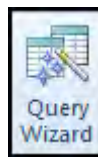
For this Query I am using a separate database not the northwind.

I have created a table called TblCustomers and added the following data:

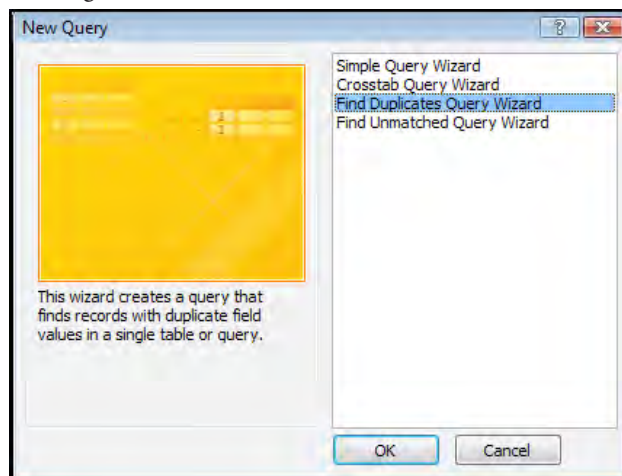
| Company Name | Contact Name | Address | City | Postal Code | Phone |
|---------------------------|---------------------|---------------------|-------------|-------------|----------------|
| Baldwin Museum of Science | Josh Barnhill | 1 Main St. | New York | 12345 | (505) 555-2122 |
| Blue Yonder Airlines | Waleed Heloo | 52 1st St. | Boston | 23456 | (104) 555-2123 |
| Coho Winery | Pica Guido | 3122 75th Ave. S.W. | Seattle | 34567 | (206) 555-2124 |
| Contoso Pharmaceuticals | Jean Philippe Bagel | 1 Contoso Blvd. | London | NS1 EW2 | (171) 555-2125 |
| Fourth Coffee | Julian Price | Calle Smith 2 | Mexico City | 56789 | (7) 555-2126 |
| Coho Winery | Christine Hughes | 3122 75th St. S. | Seattle | 34567 | (206) 555-2125 |
| Humongous Insurance | Steve Riley | 67 Big St. | Tampa | 1234 | (916) 555-2128 |
| Trey Research | Dana Birkby | 2 Nosey Pkwy | Portland | 43210 | (503) 555-2129 |
| Fourth Coffee | Reshma Patel | Calle Smith 2 | Mexico City | 56789 | (7) 555-2233 |

► To create a find duplicates query

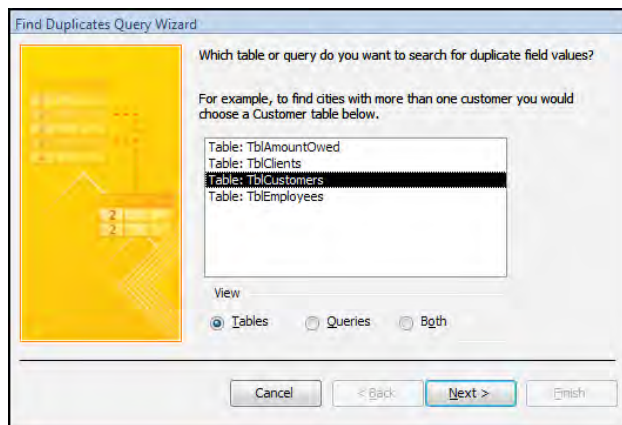
MOUSE



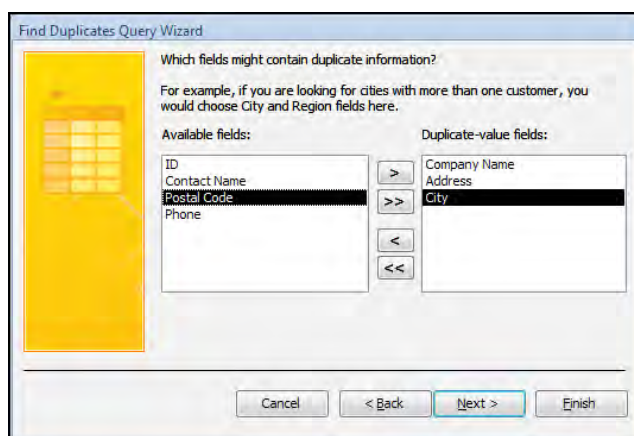
1. On the **CREATE** tab, in the **QUERIES** group, click **QUERY WIZARD**.
2. In the **NEW QUERY** dialogue box, click **FIND DUPLICATES QUERY WIZARD**, and then click **OK**.



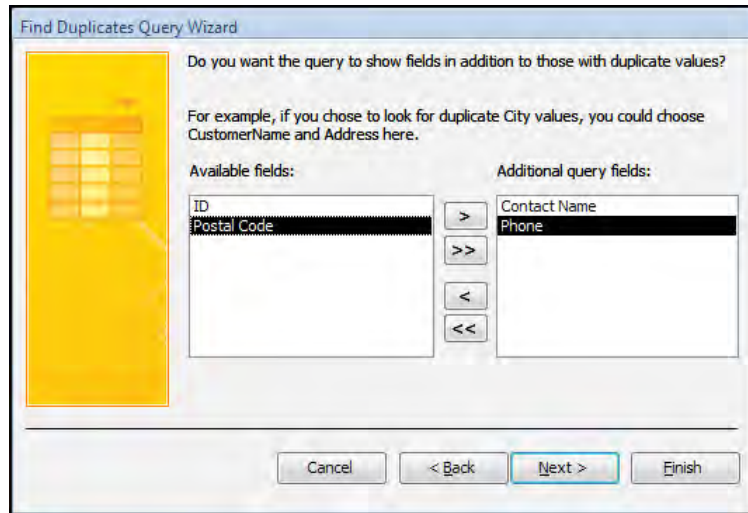
3. If an alert message appears and tells you that the feature is not installed, click **YES** to install the wizard.
4. In the list of tables, select the table that contains your duplicate data, and then click **NEXT**. Select TblCustomers.



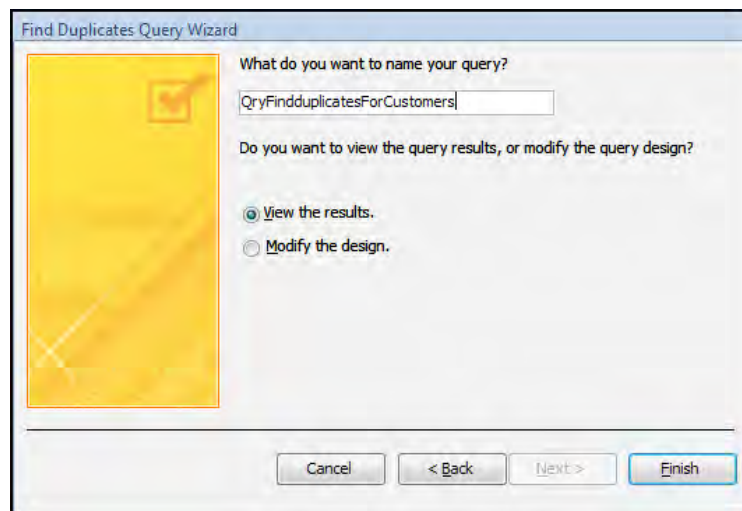
5. In the list of available fields, select only the field or fields that contain duplicate information.



6. Add only the “Company Name”, “Address” and “City fields”, these are the only fields that contain character-for-character matching values. Click **NEXT**.
 - *If the fields that you add in this step do not contain character-for-character matches, the query might not return any results.*
7. In the next list of available fields, select the field or fields that contain the data that you want to inspect or update, or those that contain data that can help you distinguish duplicate from non-duplicate records. Add the “Contact Name” and “Phone fields”, because the data in those fields can help you find the duplicate values and possibly identify why the values were entered. Click **NEXT**.



8. Name the Query “QryFindduplicatesForCustomers” and then click **Finish**.



9. Run the query. You will see the following result:

| Company N | Address | City | Contact Nan | Phone |
|---------------|---------------|-------------|--------------|--------------|
| Fourth Coffee | Calle Smith 2 | Mexico City | Reshma Patel | (7) 555-2233 |
| Fourth Coffee | Calle Smith 2 | Mexico City | Julian Price | (7) 555-2126 |

10. When you created the Customers table, you might have noticed more than two duplicate records (the table contains four). You don't see the other duplicates because the values in the Address field don't match character-for-character. You can modify the query to return values that partially match.

To see Section 6-12 download

Access 2010: Part III

Access 2010: Part IV