

# 8 MORE ON DATABASE USE

## Manipulating the Data in the Database

### LEARNING OUTCOMES

Lesson 6 introduced you to the database concept in general, and to the *Base* database in particular. You learned how to plan a new database, how to set it up, how to add records, make changes to records, and delete records. You also learned how to save a database, and how to make backup copies.

It is now time to start using those functions of the database that make it such a powerful tool for learning—for organizing data resulting from research, for helping you or your students to work on projects, for personalizing your interaction with students, and so forth. Some of the exercises cover aspects of database use—rules for finding and sorting records, for example, as well as querying a database and creating reports from subsets of data—which may be difficult for you to grasp. Forewarned is forearmed; put your thinking cap on!

Lesson 8, then, after reviewing the basics, will introduce you to the following additional features of the *Base* database:

- searching and querying a database
- sorting records
- creating reports
- improving the report (making changes)
- printing reports

**A caveat before you begin:** You'll find it easiest to use the tutorial if you follow the directions carefully. On computers there are always other ways of doing things, but if you wander off on your own be sure you know your way back!

### 8.1 GETTING STARTED

#### Setting up for the tutorial

If you completed Lesson 1 of these tutorials, you may recall that it assumed that you received a copy of the set of *Work Files for LibreOffice* that accompany these tutorials, and it also helped you

create a new folder called Data Files. If you did not complete Lesson 1, then you must do this now, before proceeding with Lesson 8. If you did complete Lesson 1, then you can skip the rest of this section and proceed directly to the next section (Continuing with the tutorial, on page 250).

The set of *Work Files for LibreOffice* ideally should be stored on a Flash drive (USB drive) in three folders named *Base Files*, *Impress Files*, and *Miscellaneous Files*. You need to create a fourth folder for the *data files* that you will be creating while working your way through the tutorials. This fourth folder will be called *Data Files*.

If you do not have these four folders and files ready, prepare them now before proceeding with this tutorial. Here are the steps to take:

First, **Unzip** the set of **Work Files for LibreOffice** by double clicking on the File name on your computer (your instructor will help you with this if you are working with a class) and **Extract** them onto your flash drive

**Double click** on the **Work Files for LibreOffice** folder to **open** it

Now, inside the *Work Files for LibreOffice* folder you need to create a new, *fourth*, folder called *Data Files*. Here's how you do this.

In the **Work Files for LibreOffice** folder, select **New Folder** (Fig. 8.1).

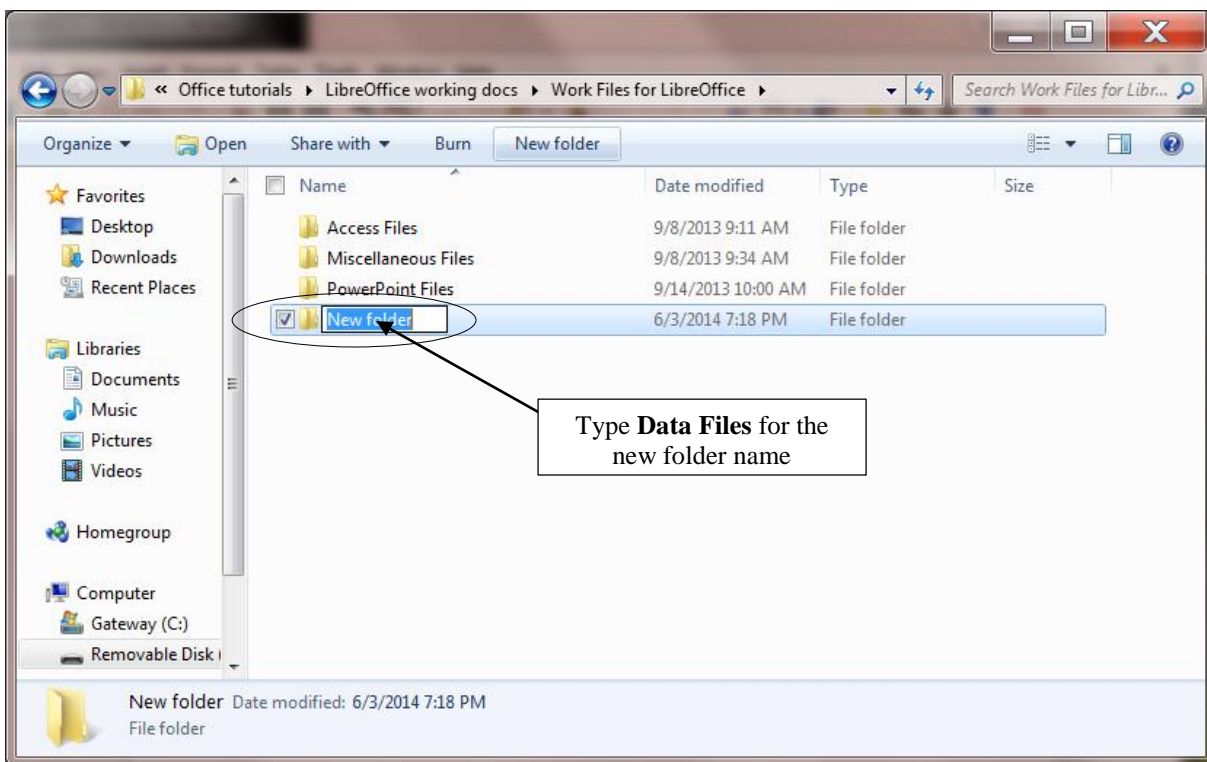


Fig. 8.1 Creating a New Folder

The system will create a new folder for you and then wait for you to give it a name of your choice (Fig. 8.1 above).

Call the new folder **Data Files**

During the course of these tutorials you will be storing many files in this Data Files folder.

### Continuing with the tutorial

What are the some of the advantages that electronic databases have over manual record keeping systems such as filing cabinets, folders, rolodexes, and the like? By the time you completed Lessons 6 and 7, you must have had a clearer idea of what a database is, and can probably now come up with an answer to this question. Here are a couple of the reasons frequently forwarded for using a database. Can you find your response among them?

- One can store huge amounts of data in a small amount of space (on a 2014 generation USB/flash drive or, even better, a hard disk—not to begin to mention the so-called Cloud<sup>1</sup>— you can store millions of database records);
- One can easily manage all the data—view records, add new records, delete old records, or change existing records.

You learned how to handle tasks such as these in Lesson 6. Here are some other reasons for using an electronic database.

- One can quickly find anything one needs to know, and get answers to questions about the data in the database. *What is Larry Dorey's phone number?*
- One can home in on a small subset of the data. *Which students have a GPA below 2.0?*
- One can instruct the computer to arrange (sort) records, and thus organize the data any way one likes. *I'd like a listing with everything sorted based on the student hobby field. That'll make it easy for me to identify students who have the same interests.*
- One can use the computer to create any number of reports for the purpose of supplying others with information pertaining to the data in the database. *My principal, Yvonne Singer, wants a monthly report of student progress in Reading, Writing, Math and Science.*

The purpose of this tutorial is to help you learn how to use the *Base* database in these last four ways. By the end of the tutorial you will have the basic skills you need to become a power user of the database. Whether you ever can call yourself a skilled user will depend, of course, on whether or not you continue to use *Base* as a tool to support your professional work in the classroom. Practice makes perfect. If, after you complete this lesson, you never use a database again... Well, let's not go there, OK?

Make sure you have your **Work Files for LibreOffice** available on your computer, then Open *LibreOffice* and, from the **File menu**, select **Open**

*Base* will display the **Open** dialog box.

Navigate to your **USB Drive > Work Files for LibreOffice > Base Files** folder

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<sup>1</sup> The Cloud, as it's called, is a virtual place which companies such as Apple and Microsoft (to name but two) have configured in such a way that it can handle massive—as in humongous—amounts of data that are actually stored on a large number of computers connected through a real-time communication network such as the Internet. You don't need to think about where your data is; you just use the Cloud to store copies of your data somewhere safe and *off* your own computer.

You are going to work first with a database similar to the one you created in Lesson 6. The database, called *Students 2014*, has been prepared for you to use with this tutorial in order to standardize the directions that follow.

In the **Base Files** folder open the **Students 2014** database (**NOT** the **Student Roster 2014** database)

In the **left frame** of the **Students 2014 Base** window, click on the **Forms icon**, then, in the **Forms** section, **double click** to open the **Students 2014 Form**

You should see the Forms View of the Students 2014 database, as illustrated in Fig. 8.2.

First Name	Elizabeth	Place in Family	6
Middle Name	Anne	Clubs	Home improvementCrochetCooking
Last Name	Hoden	Hobbies	ReadingGardening
Home Contact	Mr and Mrs Hoden	Favorite Sports	JoggingTrackBicycling
Nick Name	Beth	Favorite Subjects	English LitMathGeography
Gender	F		
Address 1	23 Main Street		
City	Richland		
State	PA		
Zip	23243		
Phone Number			
Date of Birth	10/12/1985		
Brothers	2		
Sisters	3		

Fig. 8.2 The Forms View of the Students 2014 database

## 8.2 REVIEWING THE BASICS

You may not have worked with databases a great deal prior to using these tutorials, so it will be a good idea to start by recapitulating what you learned in Lesson 6 by way of reinforcement. Then

you can move on to learn about the new features of the *Base* database that are targeted for this tutorial. Let's start with terminology.

A database is a document which contains a set of records. Each record is made up of one or more fields, and each field may or may not contain entries.

For example, a database of movie titles might have records for a few thousand movies. Each record will have fields for the movie title, the director, the producer, the star(s), and so on. A particular entry for the Movie Title field might be "Star Wars."

### Viewing the data in the database

When you first open an existing database, it is generally best to open a *Forms View* of the database because you can easily view the contents of an entire record on the screen, thus showing you what all the records basically contain.

In the Forms View, as you can see, the data for one complete record is shown in the Form. Notice the database navigation tools at the bottom of the Form window (Fig. 8.3).

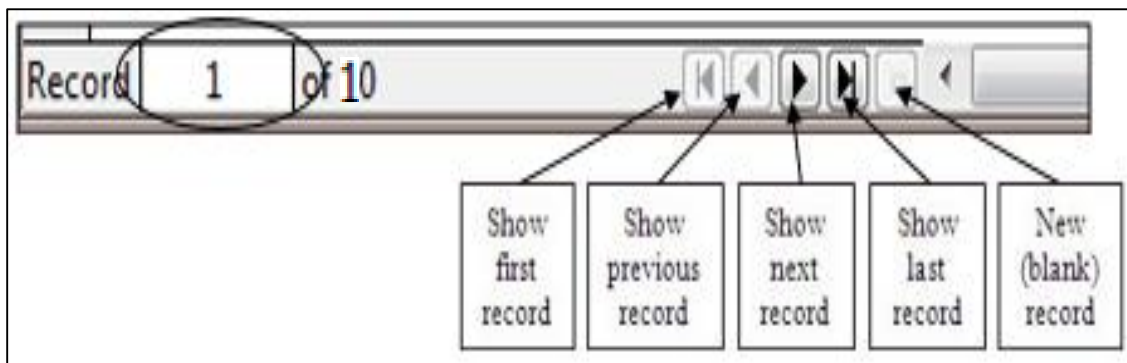


Fig. 8.3 Navigation tools in the *Base* database

Look them over now to re-familiarize yourself with how they work.

Now, **close** the **Student 2014 Form** and, in the **Database frame**, switch to **Tables**, and, in the **Tables** section, **double click** on **Student 2014 Table** to open it

This Table view (Fig. 8.4) shows the records across the screen in rows and columns much like the Spreadsheets you learned to use in Lessons 4 and 5.

	First Name	Middle Name	Last Name	Home Contact	Nick Name	Gender	Address 1	Cit
▶	Elizabeth	Anne	Hoden	Mr and Mrs Hoden	Beth	F	23 Main Street	Richla
	Angela	Mary	Haverilla	Mr and Mrs Haverilla	Angie	F	22 Feldstone St	Johnst
	Alice	Louise	Garbett	Mr. Freedman	Ally	F	P.O.Box 123	Windb
	Bernard	John	Ritter	Mr and Mrs Ritter	Bernie	M	123 Main Street	Ligoni
	Netiva	Esther	Cantor	Mr and Mrs. Cantor	Neti	F	17 Chicago Blvd	Richla
	Joan	Mary	Hodges	Mrs. James	Joan	F	45 Chicago Blvd	Johnst
	Rebecca	Marilyn	Randall	Mr and Mrs Randall	Beckie	F	435 Knightdale Drive	Johnst
	Dawn	Jane	Klochak	Mr and Mrs Klochak	Dawn	F	P.O.Box 4	Windb
	Sally	Joanne	Richter	Mrs Hodgkins	Sal	F	42 Smallman	Windb
	Benjamin	David	Franklin	Mr and Mrs Franklin	Benjie	M	67 Homewood	Johnst

Fig. 8.4 Viewing records in the Table view

### Adding a record to the database

You can add a new record to the database any time you want. After you've added the record you can tell *Base* to sort everything into a specific order whenever you need to do so. You will learn how to do this in a later section of this tutorial (8.4 SORTING RECORDS).

You are going to add a couple of new records now. It's easiest to do this in the Forms view of the database.

**Close the Student 2014 Table**, in the left frame select **Forms**, and **double click** to open the **Student 2014 Form**, then click on the **New** button in the toolbar at the **bottom** of the **Form window** (Fig. 8.5)

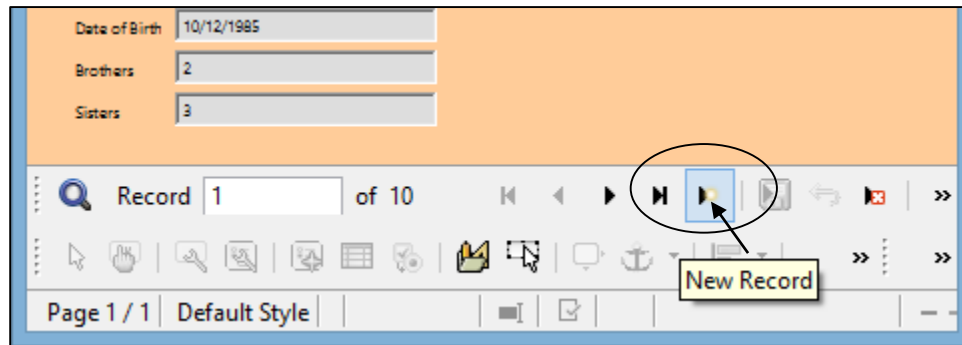


Fig. 8.5 The New button in the Records Group of the Home Ribbon

This will open up a set of empty fields for the new record (Fig. 8.6)

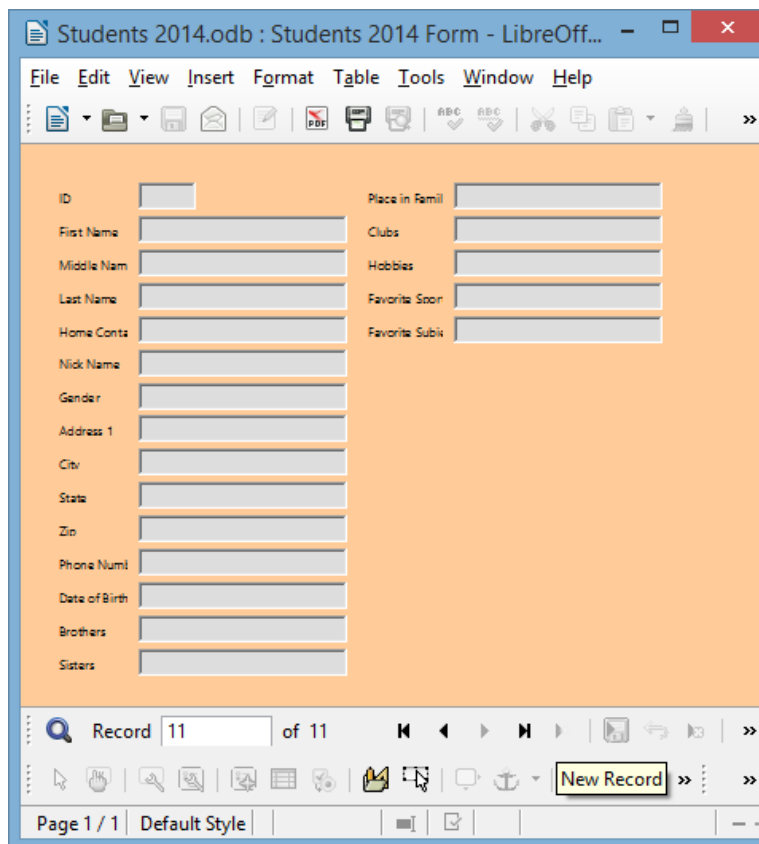


Fig. 8.6 Entering data for a new record

Enter the data for this **new** record, then add data for at least one other new record (**two records in all**), pressing the **Tab** key after you type the data for each field

You can put any data in the new records you are adding because you'll delete them in a bit. If no data is *required* for a particular field, you can even skip a field (such as the last four fields), by simply pressing Tab without entering any data.

### Clearing a field in a record

You cannot clear entries from a field that has been defined as *requiring* data of some kind in the field. If you try to clear data from these fields (in our database the *First Name* through the *Home Contact* fields, for example) you will get a warning from *Base* telling you that you cannot have a *null value* in these fields.

Use the **navigation tools** (see Fig. 8.3 on page 252) to go back to the **first** of the records you added just now

In the **first** of the records you added just now, in the **Nick Name** field, **double click** in the **entry box** (not on the field name) to **highlight** the **Nick Name entry**, then press **Ctrl+x** on the keyboard to **cut** the data in the Nick Name field

Next go to the **second** of the records you added a moment ago, click in the **Clubs** field **entry box** and again select the data in the **Clubs** field, then press **Ctrl+x** on the keyboard to **cut** the data in the **Clubs** field

Notice that this does not delete the field or the record; it simply clears the selected *data* in the field. The field is still there, so new data can be entered at any time.

### Deleting (clearing) a record, or a set of records

Locate one of the records you just added, then in the **Form Navigation toolbar** (Fig. 8.7), select **Delete Record**

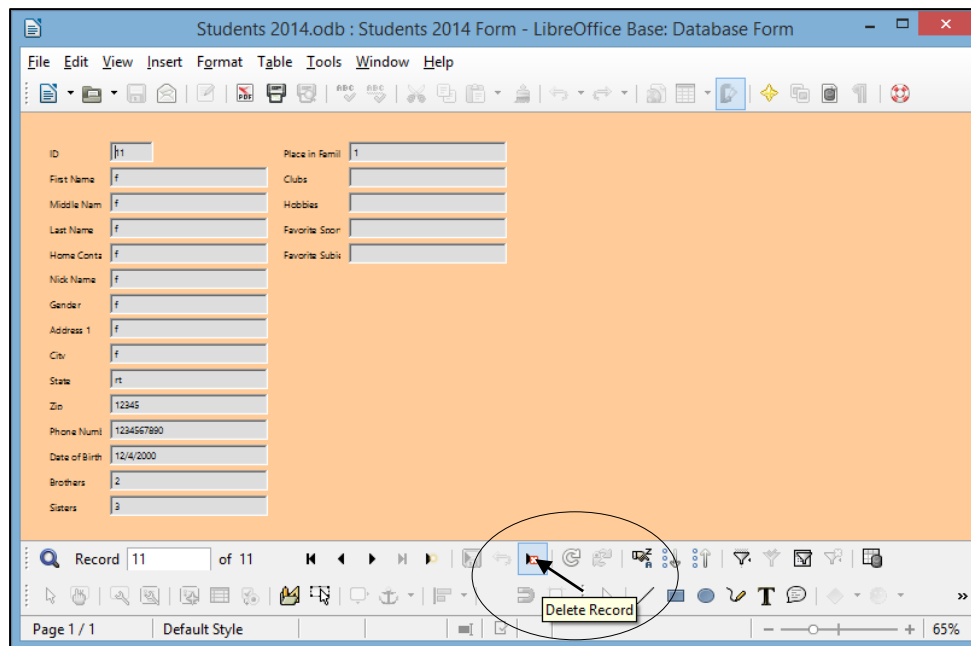


Fig. 8.7 Deleting a Record

*Base* immediately displays a warning dialog box (Fig. 8.8) to tell you that if you go ahead you will permanently lose the data in the record.

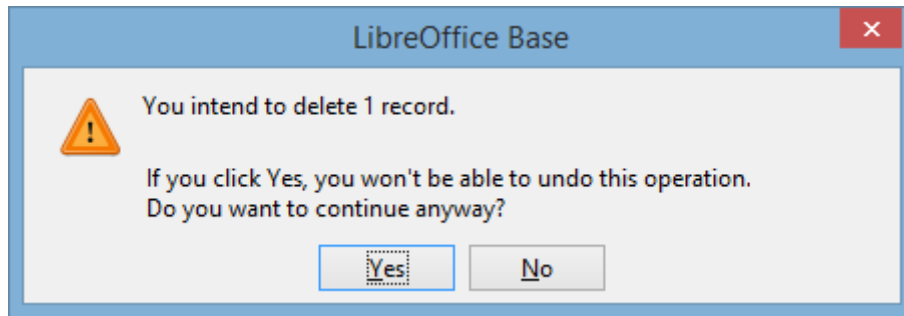


Fig. 8.8 Delete Record warning prompt

Click on **Yes** to delete the selected record

Notice that this removes the record entirely.

### Changing the data in a field

Suppose some data gets entered incorrectly—through misspelling or a typo. Let's say you needed to update a nickname in a student's record. To change it you would do the following.

Locate the record in which you want to make the change (for this exercise select any record you like)

Click in the entry box for the **field data** that needs to be changed (use any entry in the **Nick Name** field), then change it to some other nick name in the same way you would in a word processor

All of the exercises in this section were by way of recapitulating what you learned in Lesson 6. Now let's move on to learn some more advanced features of the *Base* database.

## 8.3 SEARCHING AND QUERYING A DATABASE

This is a powerful function of the *Base* database. You can find anything in the database if you know what to do.

All you have to do is give *Base* any set of characters as the key for a search of the database, and the system will find that set of characters, if it exists, even if it is just a part (a subset) of a larger word or phrase. There are several ways you can do this.

But first you need to open another, larger, database.

**Close** the **Students 2014 Form**, then **Close** the **Students 2014** database, and from the **File** menu select **Open**

The USB drive containing your *Work Files for LibreOffice* should still be in a USB port on your computer.

On your **USB drive** > **Work Files for LibreOffice** > **Base Files** folder open the **Birds** database



In the **Database** objects menu on the **left side** of the database window, click on **Forms** and, in the **Forms** section, open the **Birds Form** (Fig. 8.9)

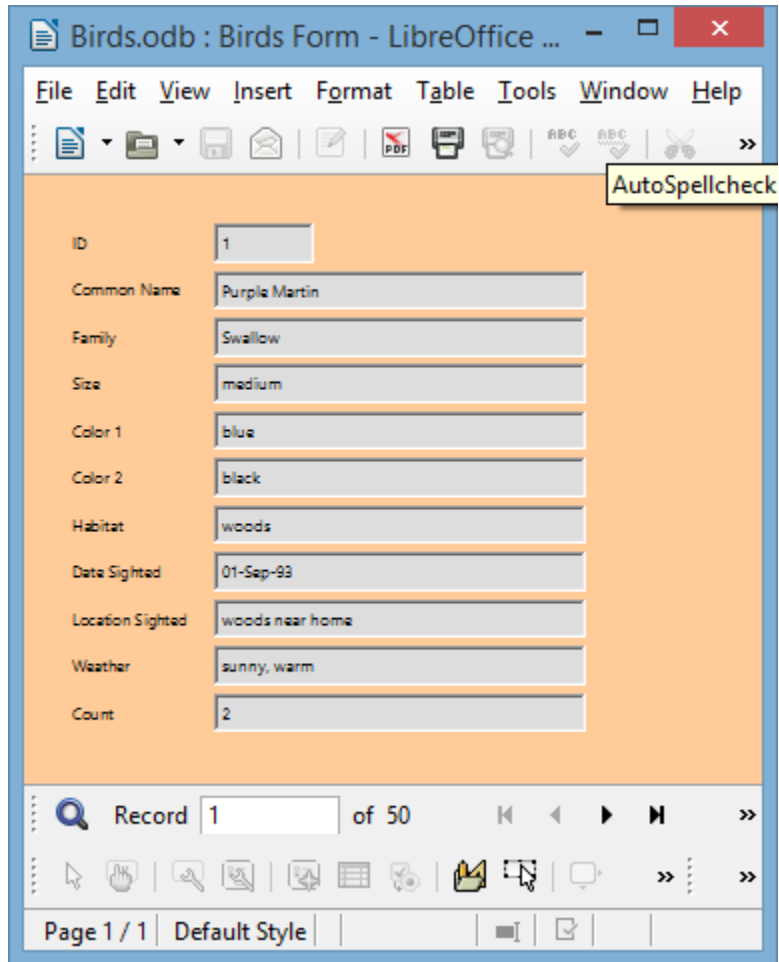


Fig. 8.9 Bird Sightings Form

### Finding a single record using data from a specific field

You often may need to locate and display the contents of one particular record, or set of records, based on data from one specific field. The Find function, which is in the Home Ribbon > Find Group, is the *Base* command to do this. It works much the same as when you use the Find command in the word processor, which you learned about in Lesson 2.

Suppose, for example, you wanted to find the record for the bird with the Common Name *Northern Oriole*. Here is how you do this.

In the **Form Navigation toolbar** at the **bottom** of the **Form window**, click on the **Find Record tool**—it looks like a spy glass (Fig. 8.10)

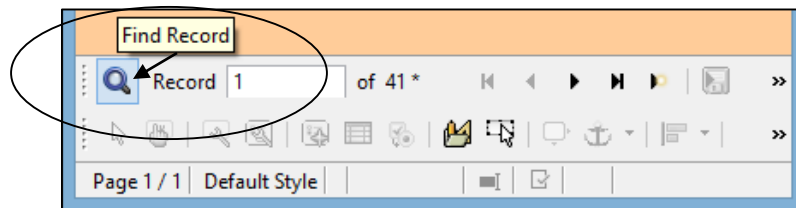


Fig. 8.10 The Find Record tool in the Form Navigation toolbar

LibreOffice now displays the Record Search dialog box (Fig. 8.11).

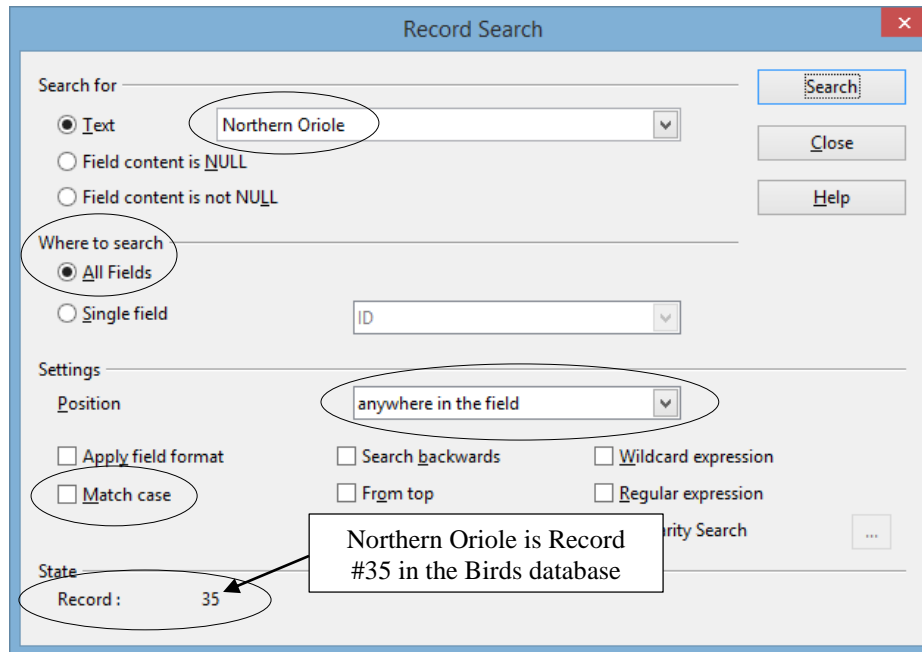


Fig. 8.11 The Record Search dialog box

You need to indicate what data you want to be found in the *Birds* database by typing in a search string (which for our search will be *Northern Oriole*).

In the **Search for** entry box type **Northern Oriole** (or **northern oriole**—if you don't check the **"Match Case"** box, *Base* doesn't care whether you use upper or lower case letters)

Before clicking on the *Search* button, you need to identify where you want to search (All Fields). You also need to indicate if you want to match the data in a whole field or part of a field.

Click to check the **radio button** next to **All Fields**, and leave the selection for **anywhere in the field**, and there's **no need to match case**

Now click on **Search**, and notice that the **number 35** appears in the **lower left** hand corner of the search window, indicating that the **Northern Oriole** is **record #35** in the database

The record(s) you find with a Find request are called the "found set". As you see, *Base* quickly locates the record containing the name "Northern Oriole." The record is displayed in the *Birds Form window*.

Of course, if you typed *Northern Oriole* incorrectly, *Base* would tell you that the search item was not found (Fig. 8.12).

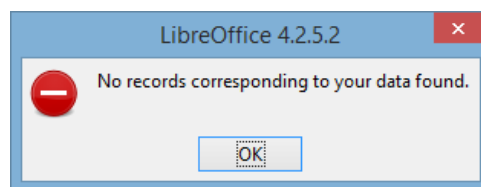


Fig. 8.12 Warning message after unsuccessful search of the database

**Close** the **Find and Replace** dialog box, then in the **Home Ribbon > Views** menu, select **Table View** to see the records following the **Northern Oriole** record

### **Finding two or more records based on data from a single field**

Next, let's search on criteria which will find more than one record. You want to find any bird with the primary color (*Color1*) that has any shade of black in its plumage.

**Close** the **Record Search** dialog box

In the **Birds Form**, click to put the cursor anywhere in the **Color1** field

In the **Form Navigation toolbar** at the **bottom** of the **Form window**, click on the **Find Record tool** and, if it's not already the color you want, in the **Search for > Text** box, type the word **Black**, and in the **Where to search > Single field** box, make sure **Color 1** is selected, and in the **Settings > Position** box select the option for **Anywhere in the field**

Click on **Search**, then move the **Record Search dialog box** out of the way, if necessary, so you can see the contents of the record

The search finds the first of *11 records* where a bird in the database has the color “black” or even “blackish” in its plumage.

To see the data in the next record, click on **Search** again, and so on

See if you can count **11 records** of birds with the color **black** or **blackish** in the plumage?

To see a listing of *just those 11 records* that result from a search such as this, you must use a filter.

### **Using the AutoFilter**

In general, filtering is best done in the Table view of the database. The exercise that follows will use *LibreOffice's AutoFilter* tool to select the set of birds whose habitat is “marshes.”

**Close** the **Record Search** dialog box and **close** the **Birds Form** then, in the **Database frame** (Fig. 8.13), click on **Tables** and, in the **Tables section**, **double click** on the **Birds Table**

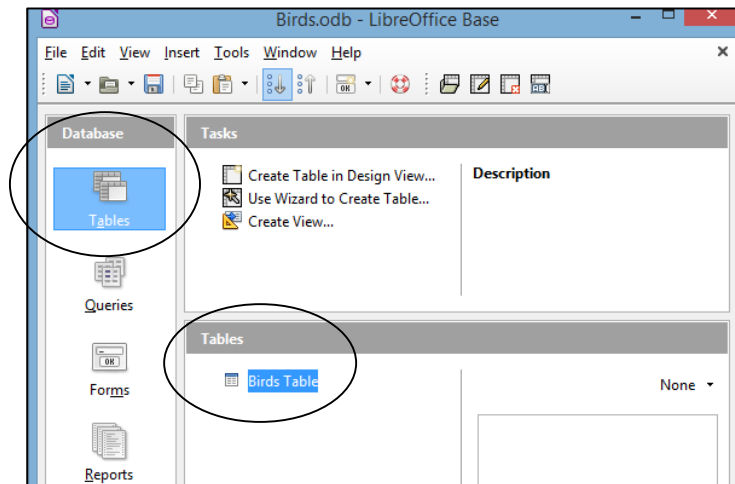


Fig. 8.13 The Database Tables object > Birds Table

In the **Birds table**, scroll to the **right** to locate the **Habitat** column (Fig. 8.14)

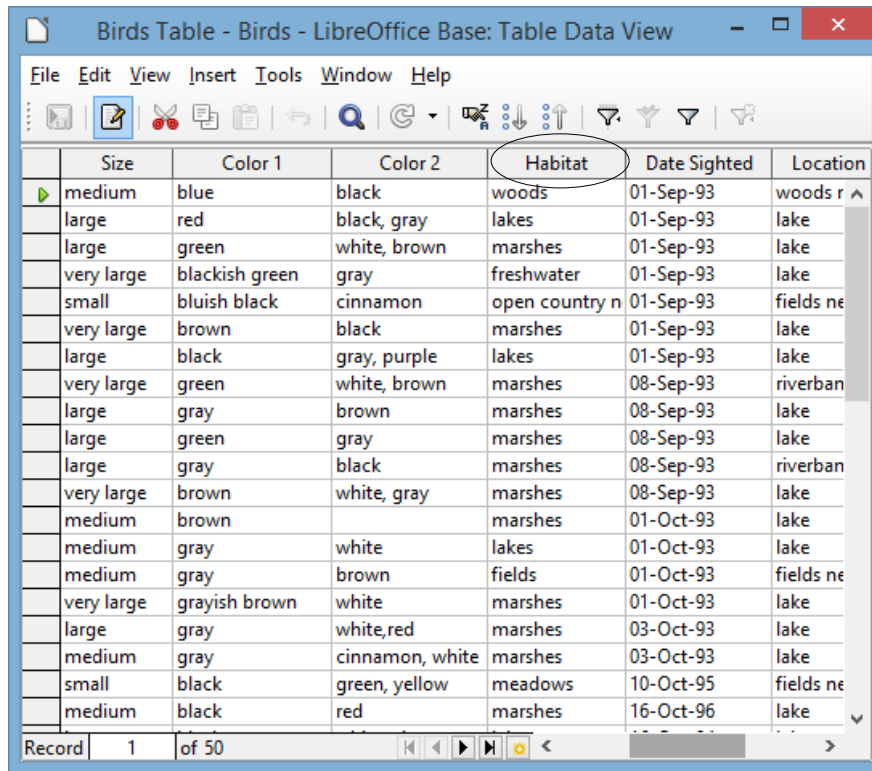


Fig. 8.14 The Birds Table view showing the Habitat column

Now click, in the **Habitat column**, on the first **Marshes** entry you see (there's one in the **third entry** in the Habitat column), then, in the **Tables toolbar** at the top of the **Birds table**, click on the **AutoFilter** tool (Fig. 8. 15)

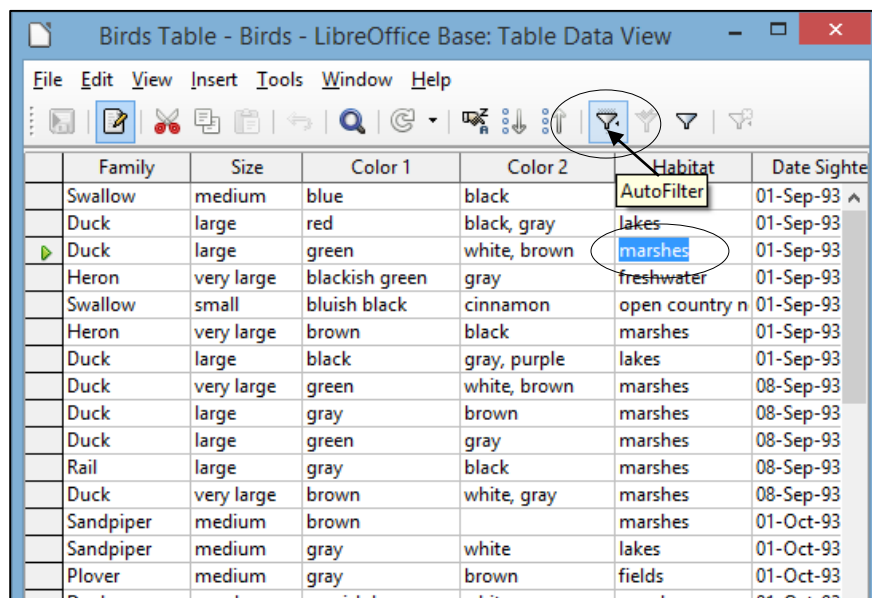
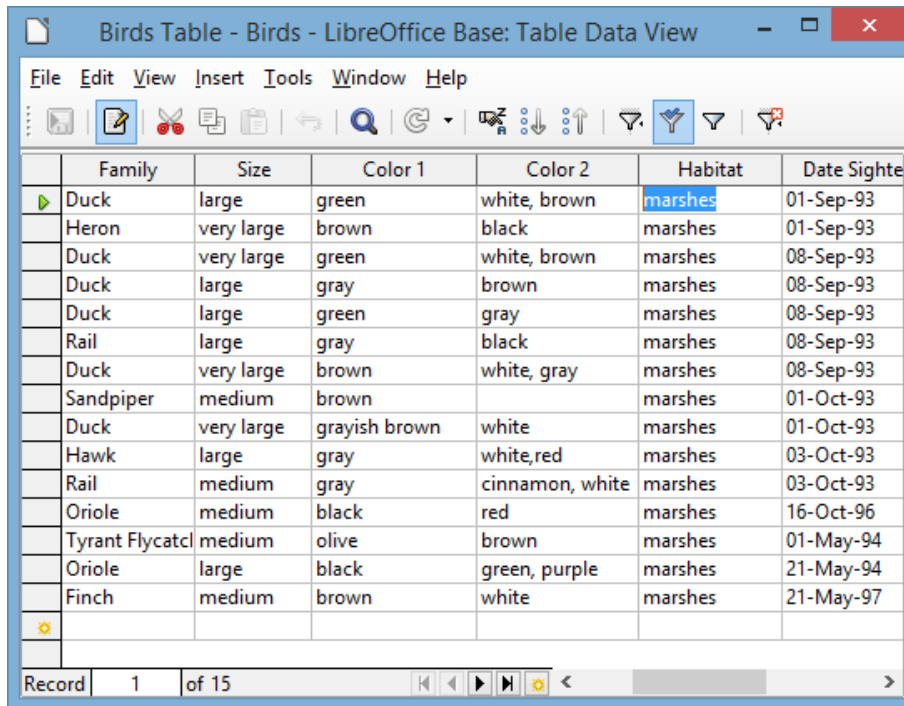


Fig. 8.15 Using the AutoFilter tool to find all the birds that have a Marshes Habitat  
This tells *Base* that you want to filter by selection the set of birds that live among marshes.

Base now displays a list of 15 birds in the database that live in marshes (Fig. 8.16).

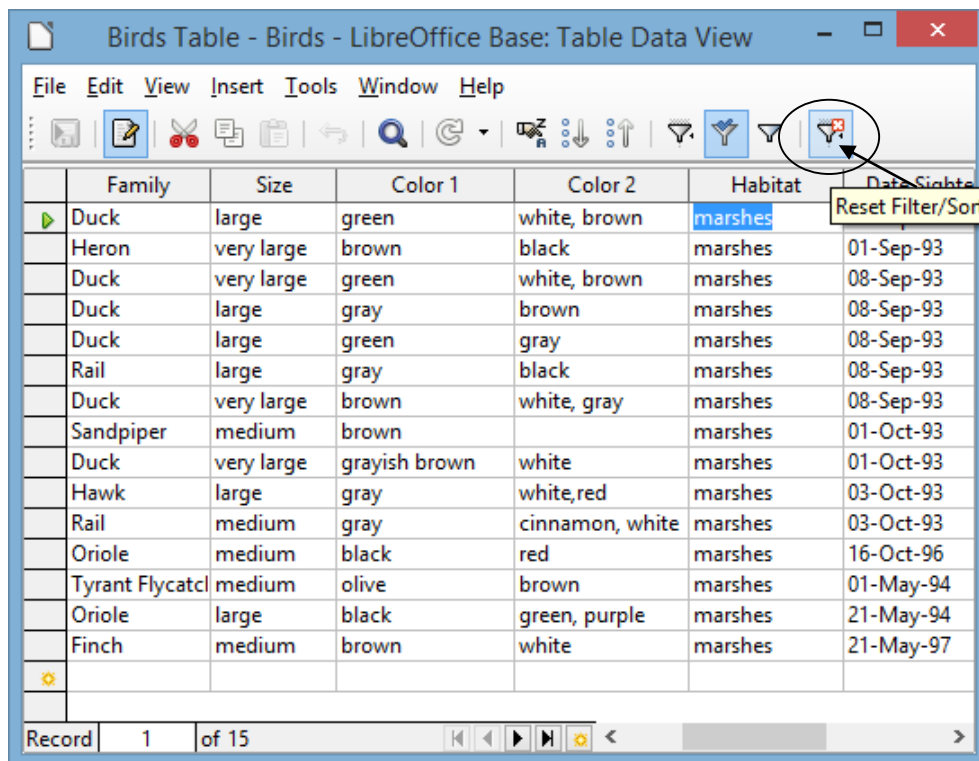


The screenshot shows the 'Birds Table - Birds - LibreOffice Base: Table Data View' window. The toolbar includes a 'Reset Filter/Sort' icon (a funnel with a red 'X'). The table below displays 15 records, all with 'marshes' in the Habitat column.

	Family	Size	Color 1	Color 2	Habitat	Date Sighted
▶	Duck	large	green	white, brown	marshes	01-Sep-93
	Heron	very large	brown	black	marshes	01-Sep-93
	Duck	very large	green	white, brown	marshes	08-Sep-93
	Duck	large	gray	brown	marshes	08-Sep-93
	Duck	large	green	gray	marshes	08-Sep-93
	Rail	large	gray	black	marshes	08-Sep-93
	Duck	very large	brown	white, gray	marshes	08-Sep-93
	Sandpiper	medium	brown		marshes	01-Oct-93
	Duck	very large	grayish brown	white	marshes	01-Oct-93
	Hawk	large	gray	white, red	marshes	03-Oct-93
	Rail	medium	gray	cinnamon, white	marshes	03-Oct-93
	Oriole	medium	black	red	marshes	16-Oct-96
	Tyrant Flycatcher	medium	olive	brown	marshes	01-May-94
	Oriole	large	black	green, purple	marshes	21-May-94
	Finch	medium	brown	white	marshes	21-May-97

Fig. 8.16 The found set of filtered records

To go back to viewing **all the records** in the database, click the **Reset Filter/Sort** icon on the toolbar (Fig. 8.17)



The screenshot shows the same 'Birds Table - Birds - LibreOffice Base: Table Data View' window. The 'Reset Filter/Sort' icon (a funnel with a red 'X') is circled in red, and a tooltip points to it with the text 'Reset Filter/Sort'. The table below displays all 15 records from the database.

	Family	Size	Color 1	Color 2	Habitat	Date Sighted
▶	Duck	large	green	white, brown	marshes	01-Sep-93
	Heron	very large	brown	black	marshes	01-Sep-93
	Duck	very large	green	white, brown	marshes	08-Sep-93
	Duck	large	gray	brown	marshes	08-Sep-93
	Duck	large	green	gray	marshes	08-Sep-93
	Rail	large	gray	black	marshes	08-Sep-93
	Duck	very large	brown	white, gray	marshes	08-Sep-93
	Sandpiper	medium	brown		marshes	01-Oct-93
	Duck	very large	grayish brown	white	marshes	01-Oct-93
	Hawk	large	gray	white, red	marshes	03-Oct-93
	Rail	medium	gray	cinnamon, white	marshes	03-Oct-93
	Oriole	medium	black	red	marshes	16-Oct-96
	Tyrant Flycatcher	medium	olive	brown	marshes	01-May-94
	Oriole	large	black	green, purple	marshes	21-May-94
	Finch	medium	brown	white	marshes	21-May-97

Fig. 8.17 Reset Filter/Sort tool in the Table Data toolbar

### Using the Standard Filter

You also can filter records using *LibreOffice*'s Standard Filter. You need this, for example, if you need to select a set of records based on more than one criterion.

Let's say you want to find all the records in which the birds have either the color "black" or a combination of "black" and some other color in their plumage. This involves filtering based on both the Color 1 and Color 2 fields.

In the **Table Data toolbar**, click on the **Standard Filter tool** (Fig. 8.18)

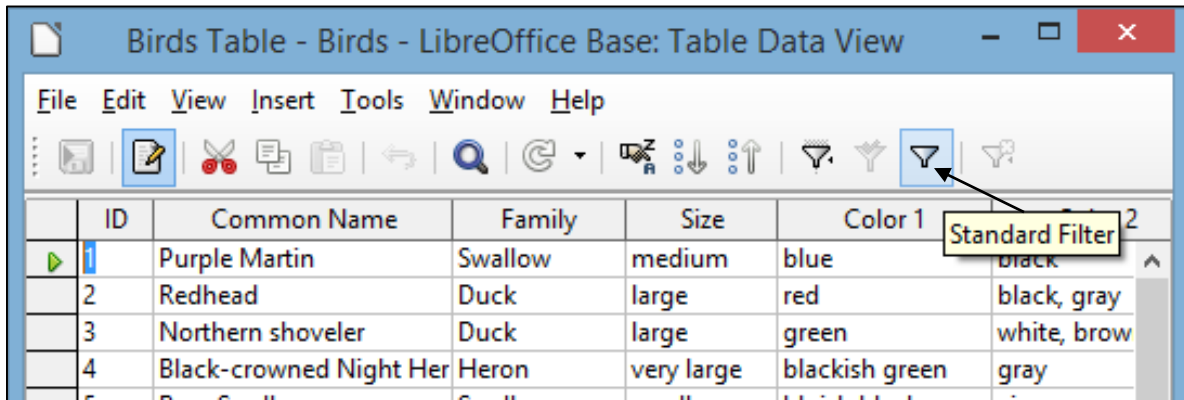


Fig. 8.18 The Standard Filter tool

When you click on the Standard filter tool, *LibreOffice* presents the Standard Filter dialog box, in which you have the opportunity to set 2 or more criteria for the filter (Fig. 8.19).

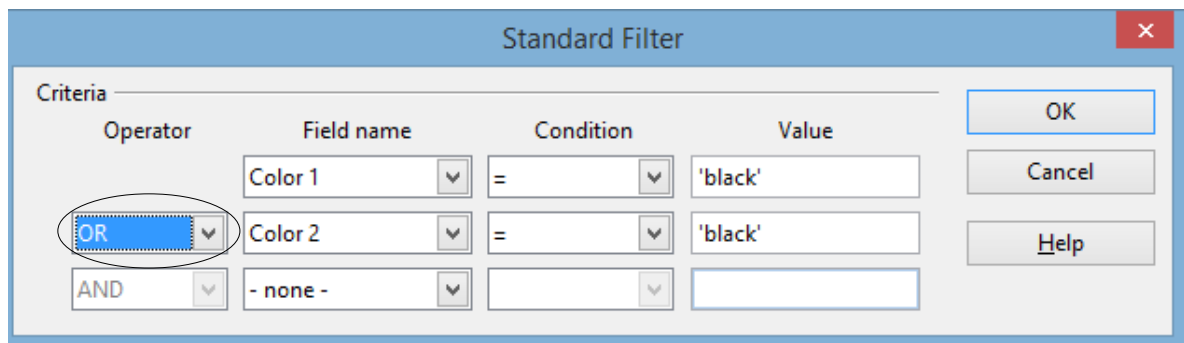


Fig. 8.19 The Standard Filter dialog box

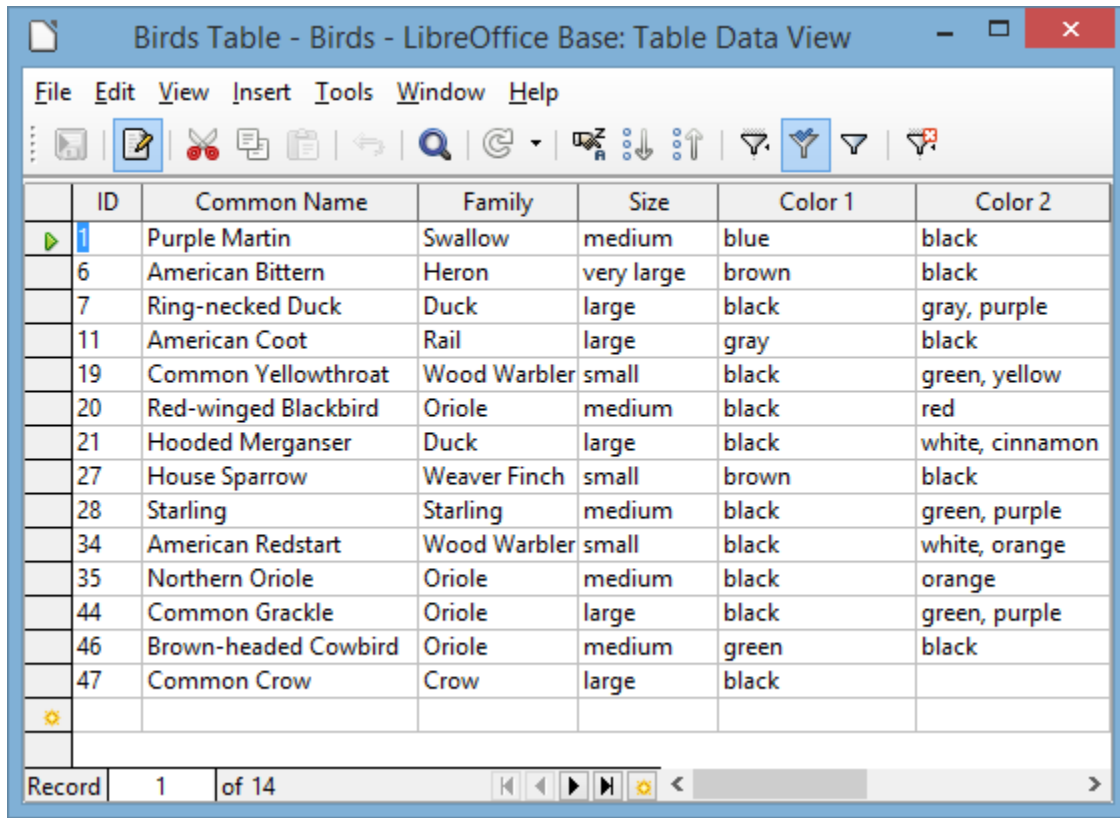
In the *first Field Name* box, click on the **down arrow** to **show all the fields** in the Birds database and click on **Color 1**, leave the **equals sign (=)** in the **Condition** box, then type **'black'** in the **Value** box

In the *second Field Name* box, click on the **down arrow** to **show all the fields** in the Birds database and click on **Color 2**, then **step back** to the **Operator** box, click on the **down arrow** and select **OR** for the operator, then leave the **equals sign (=)** in the **Condition** box, and type **'black'** in the **Value** box

These criteria that you have selected should find all the database records in which the birds have either the color "black" or a combination of "black" and some other color in their plumage. Let's see.

In the **Standard Filter** dialog box, click on **OK**

Now look at the set of records that the filter found (Fig. 8.20).



ID	Common Name	Family	Size	Color 1	Color 2
1	Purple Martin	Swallow	medium	blue	black
6	American Bittern	Heron	very large	brown	black
7	Ring-necked Duck	Duck	large	black	gray, purple
11	American Coot	Rail	large	gray	black
19	Common Yellowthroat	Wood Warbler	small	black	green, yellow
20	Red-winged Blackbird	Oriole	medium	black	red
21	Hooded Merganser	Duck	large	black	white, cinnamon
27	House Sparrow	Weaver Finch	small	brown	black
28	Starling	Starling	medium	black	green, purple
34	American Redstart	Wood Warbler	small	black	white, orange
35	Northern Oriole	Oriole	medium	black	orange
44	Common Grackle	Oriole	large	black	green, purple
46	Brown-headed Cowbird	Oriole	medium	green	black
47	Common Crow	Crow	large	black	

Fig. 8.20 Result of a Standard Filter of the Birds database

Check out the Color1 and Color 2 fields in the Found Set of 14 birds. One or other of them has the color ‘black’ somewhere in their plumage.

This might seem like a silly exercise. Maybe it wouldn’t take you long to find the 12 records out of the 50 records in the database. Wouldn’t take you a minute or two to do that, right? But suppose you have 500 records, or 5000 records, or, as is common in school districts in large cities, 500,000 records or more. The larger the database, the more you need tools such as these filter tools—and the Sort tools in the next section—to help you quickly find the data you need.

Click again on the **Reset Filter** icon (Fig. 8.17 page 260 above) before proceeding to the next section in the tutorial

## 8.4 SORTING RECORDS

The three major advantages of an electronic, digital data storage system over a manual, paper-based filing system are these:

1. Digital, electronically stored data with its easy ability to quickly access the data you need in any of multiple formats and the easy ability to organize it in any of multiple ways, provides more or less instant *organizational flexibility*—using filtering and sorting, for example—which helps you cope with the inevitable *complexity* that increases as the sheer amount of data grows.



2. Digital, electronically stored data *saves space*—physical space, that is. You don't need a filing cabinet, or oodles of filing cabinets in a storage room, or, for some companies, a whole building for a data repository. For teachers, like you and me, all we need is a few gigabytes of storage on a USB drive, which we can carry on a car key chain or in a pocket (provided we're careful to backup all the data on another computer in the office or at home).
3. Digital, electronically stored data increases the speed of data access and thus *saves time*.

When we use old-fashioned filing cabinets to store data, we usually come up with some kind of organization. So we put labels on the drawers in the cabinets and labels on the folders inside the drawers. This organization is often based on numeric or alphabetic sequencing. The purpose, of course, is to enable us to quickly find what we have stored in the appropriate folder in the appropriate drawer.

This is a good system as long as we have no cause to frequently change the organization we have set up. It also assumes that space and time are not at a premium in our day to day operations. Unfortunately, coping with change, making good use of space, and saving time are factors critical to our productivity. So we should welcome any system which helps us cope with change and optimizes our use of space and time.

Today, using state of the art technology, we can electronically store the equivalent of the Library of Congress in a shoe box. And we can now access any specific item in that "box" in a few thousandths of a second. What is more, software such as *Base* makes it possible for you to organize that data more or less on the fly by sorting it any which way you want.

### Sorting on a single field

Take, for example, the Birds database that is on your desktop at this time. As you can see, the names of the birds (in the Common Name field) are not sorted in any particular order. In fact, the database is sorted based on the *ID* field (which is the Primary Key for the relational database).

So the ordering is numerical rather than alphabetical. It would therefore be time consuming, if not well-nigh impossible—especially if the database were very large—for you to visually scan the database to find the record for a particular bird.

This is why *Base* makes available the *Find Record*, *Filter Records*, and *Sort Records* functions accessible in the Form Navigation toolbar. We've looked at the *Find Record* and *Filter Records* functions. Now let's check out the *Sort Records* function.

What if you wanted to print out a report listing all the birds in alphabetical order by name of bird? You would have to begin by organizing the records alphabetically on the bird names. Fortunately *Base* has a set of *Sort* tools that enable you to complete this operation with the greatest of ease. Fig. 8.21 illustrates where you will find this set of Sort tools.

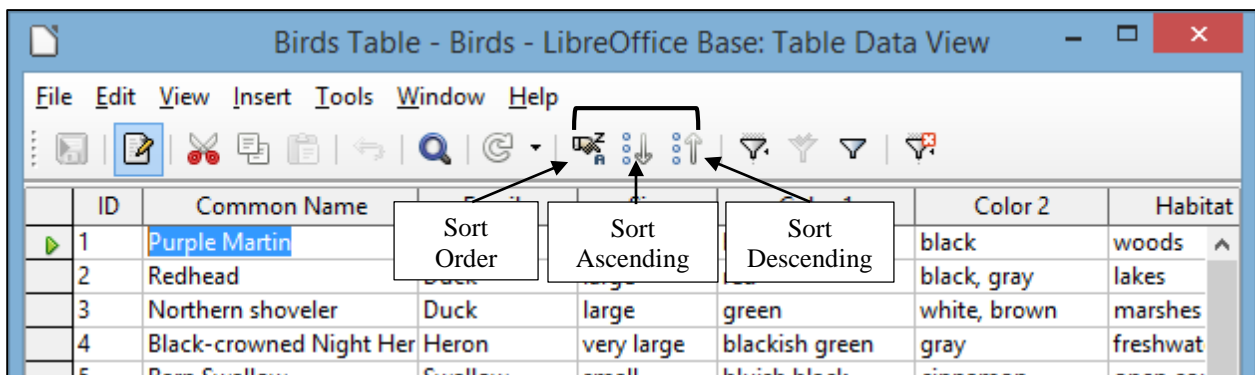


Fig. 8.21 The *Base* Sort tools in the Table Data toolbar



You can best see the results of a sort if you are in the Table view of the database, which is the view you should have on your screen from the previous exercise.

Click to put the cursor in any cell in the **Common Name** field, then click on the **Sort Ascending** button (Fig. 8.22)

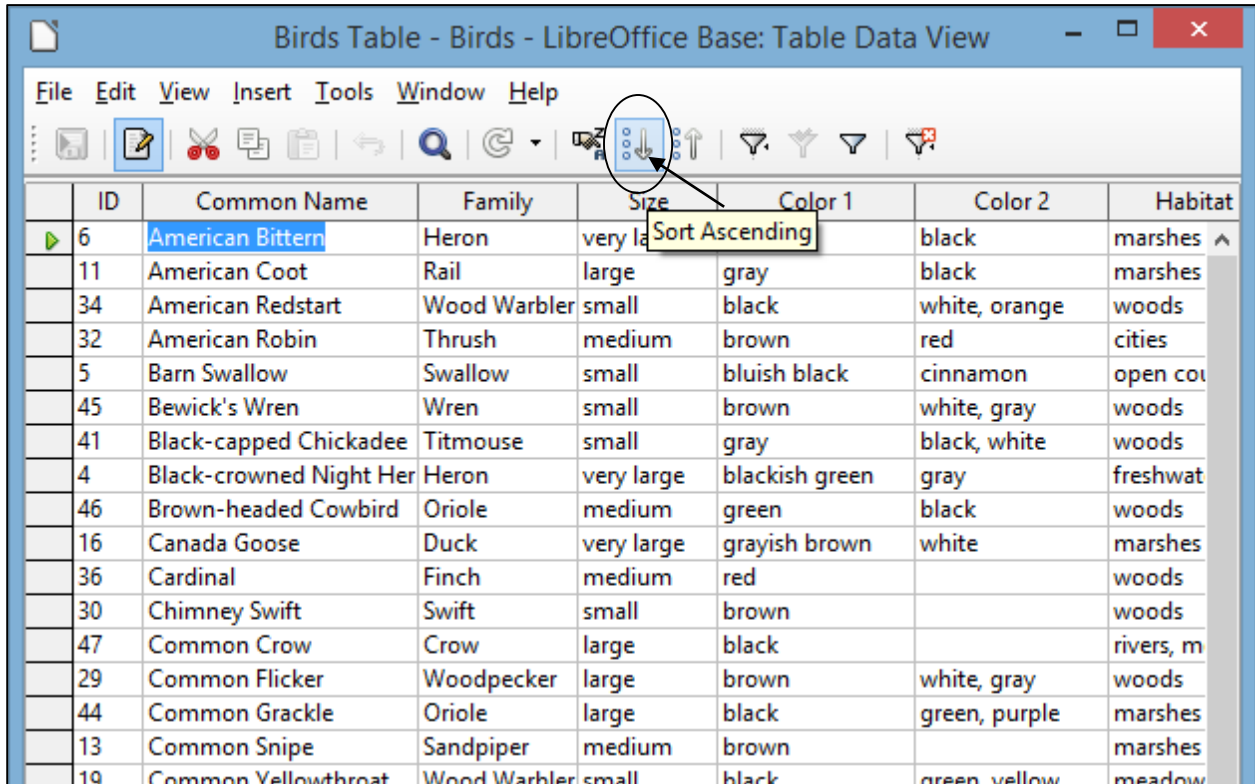


Fig. 8.22 The Sort Ascending tool

Immediately *Base* sorts the records *alphabetically* on the Common Name field, with the American Bittern at the top of the list, and so on. There are three basic sorting options depending on the type of data in the field you are using as the basis, or key, for the sort:

- If your sort request is based on a *Text field* such as Common Name or Location Sighted, the sort will be *alphabetical* and can be either Ascending (A to Z) or Descending (Z to A).
- If you are sorting on a *Number field* such as the Count field, the sort will be *numerical* and you again would be able to sort in Ascending (low number to high number) or Descending (high number to low number) order.
- Finally, if you are sorting on a *Date field* such as Date Sighted, the sort will be *chronological* and you would be able to sort in Ascending (chronological) or Descending (reverse chronological) order.

Let's do another quick sort for practice—which, as we know so well, makes perfect.

Click to position the cursor anywhere in the **ID column**, then click on the **Sort Ascending** tool (see Fig. 8.22 above) and immediately *LibreOffice* sorts the data **based on the ID field**, with the value 1 at the top and the value 50 at the bottom—and the data that goes with each ID is, of course, sorted along with it

As you see, basic sorting of a database is simple.

## 8.5 CREATING QUERIES AND REPORTS

### A word about the *Base* database reporting facility

Reports are what we submit to our bosses in response to information that they need. It doesn't matter to anyone why they need the report. All that matters is that they must have it. So we (teachers and others in the chain of command) must produce it. Period.

*Base* makes it easy to produce reports provided you have gathered into a database any and all information needed for a report. Let us assume that you have done that. What, then, are the criteria for a good report?

- Planning is still an important prerequisite for creating good reports. No matter how tempting it might be, always *resist* creating a report without first thinking and mapping out what you want as the finished version of a report.
- Changes you make to data fields for the report do *not* affect the data in the database. So you don't have to worry about losing data, or messing up the database when you create reports.
- You can create reports that contain just a few fields from a selected set of records by using the search criteria techniques that you already learned about in this lesson. For instance, you could use the Birds database to print a report listing just the name, color, and count of birds that were seen in your neighborhood. Shortly you will practice something along these lines.
- You can create numerous layouts or reports based on the data in a database, just as you can create numerous different tables or forms, each containing its own set of data from the database as a whole. Each report can be different—different fields, different sets of data within fields, and so on—and you can store them all along with the database.

In the next sections you will continue to work with the *Birds* database.

### Initial definition of the layout or report

You are going to create a layout, or report, which will list all members of the Duck family sighted during the reporting period covered by the database. The fields in the report will include the Common Name, Family, Date Sighted and Count fields.

Bear in mind that most databases have many fields. If there are more field names in a report layout than can fit across the screen or page, the names simply wrap around, creating two or more lines, if necessary, in the top section (the Header) of the layout.

This can make for untidy, not to say confusing, reports. The columnar report you are about to work with will not have this problem because you will be using only a small selection of the fields in the database (just 4 to be exact), but it is good to be aware of the problem should the occasion arise where you want to create a report that uses many fields.

You can get around this problem in various ways, the simplest of which is to change the font to one which requires less space, or reduce the size of the font you want to use, or lay out the fields in some format other than tabular (like a Table or spreadsheet). You might also consider whether you really need all the fields that you have selected for the report. Often, simpler is better. Simple reports are more likely to make the desired impact on the reader.

### Creating a Query

You need to start by using a *Query* to tell the Birds database exactly which data you want to use for the Report. You want to select only the birds in the *Duck* family for the Report. Once you have created the Query, it will be a simple matter to create the Report. Here are the steps to create the Query.

The **Birds Table** should still be **open** on your screen; **close** it, since you'll be using the **Queries** Database object for this exercise

In the **Database frame** at left, click on the **Queries** icon, then, in the **Tasks** section, click on **Use Wizard to Create Query...** (Fig. 8.23)

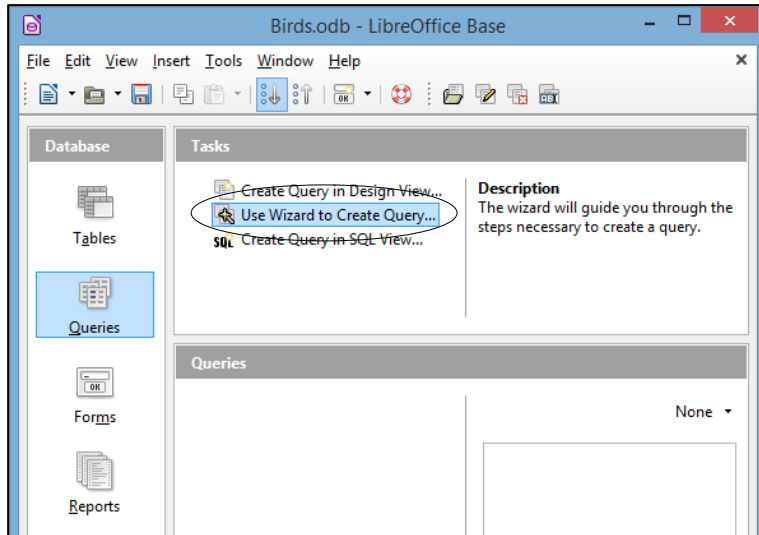


Fig. 8.23 Using a Wizard to create a Query

*LibreOffice* now presents the familiar Wizard window, asking you (Step 1) to select the fields that will be involved in the Query (Fig. 8.24)

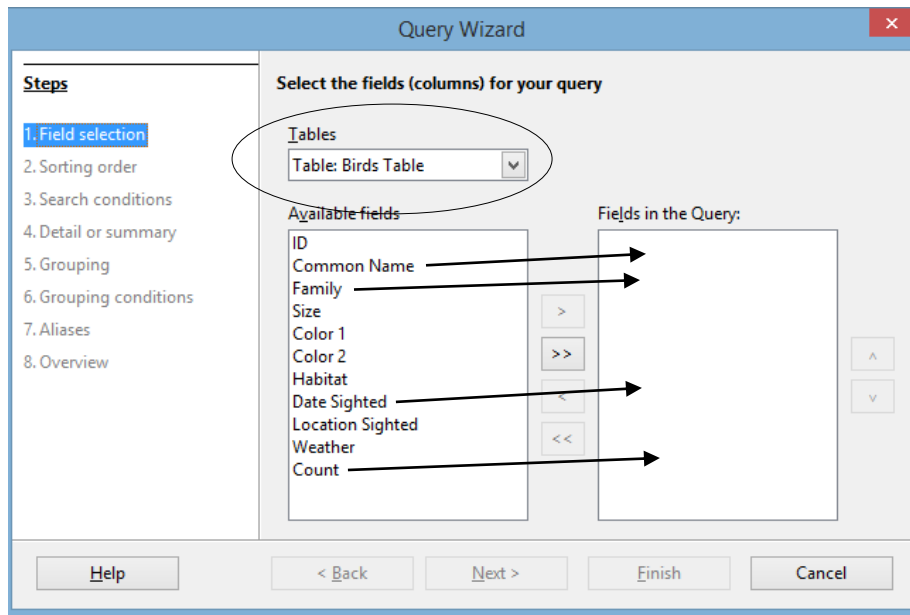


Fig. 8.24 Step 1 of the Query Wizard

Notice that the fields are all coming from the *Table: Birds Table* in the *Birds Base* database.

**Double click**, in turn, on **Common Name**, **Family**, **Date Sighted**, and **Count** fields to move them across to the **Fields in the Query** box, then click on the **Next >** button

The next step in the Wizard, Step 2, asks you if you want to sort the data. There's no need to do this—the query will take care of selecting out the data you need.

Click on **Next >** to proceed to **Step 3**

In Step 3 you're going to *Select the search conditions* for the Query (Fig. 8.25).

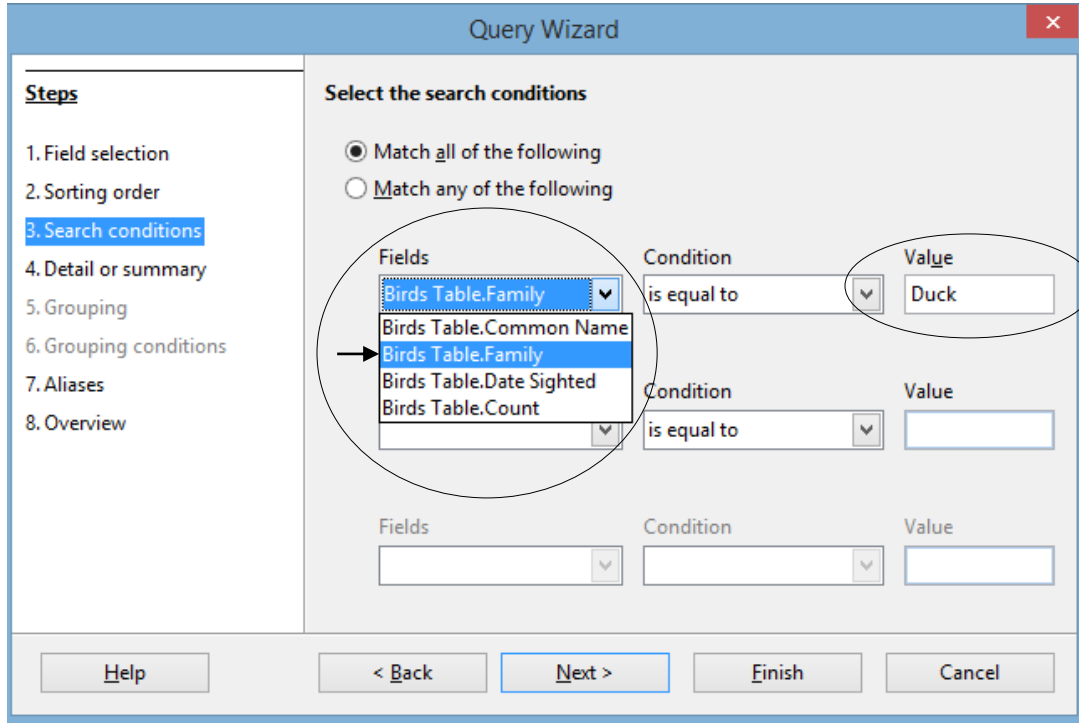


Fig. 8.25 Selecting the search conditions for the Query

In Step 1 you selected the *Fields* for the Query, and now you must select a *subset* from the family field for the *Report* you will build in the next exercise, a report which is based on the Query you are creating right now.

Click on the **down arrow** in the **first Fields box** and, in the **drop down menu** of Fields, select **Birds Table.Family**, leave the **Condition** as **is Equal to** and, in the **Value** box, type the entry **Duck** (we want every type of Duck—and only Ducks—in our report), then click on **Next >**

In the next step of the Wizard—**Step 4—Detailed query** is the default and that's what you want, so click on **Next >** again

**Steps 5 and 6** are **greyed out** because you don't need them for this query, nor do you need to change the field names in **Step 7 (Aliases)**, so click on **Next >** once again

Step 8 presents an overview of what should go into the Query that is going to determine the contents of the upcoming Report. The Title the Report will be *Count of Ducks Sighted*.

So, in this last step of the Wizard, change the **Name of the Query** to **Query\_Count of Ducks**, leave the default to **Display Query** when you finish this exercise so that you can check that the Query has successfully produced

the **Found Set** of data you want for the report, then quickly read through the **Overview** section to see if what you have done in the previous steps makes sense

When you're ready, click on **Finish**

Quickly, *Base* uses the Query to produce a display of the *Found Set* (Fig. 8. 26)

	Common Name	Family	Date Sighted	Count
▶	Redhead	Duck	01-Sep-93	6
	Northern shoveler	Duck	01-Sep-93	8
	Ring-necked Duck	Duck	01-Sep-93	2
	Mallard	Duck	08-Sep-93	4
	Gadwall	Duck	08-Sep-93	10
	Green-winged Teal	Duck	08-Sep-93	3
	Pintail	Duck	08-Sep-93	15
	Canada Goose	Duck	01-Oct-93	25
	Hooded Merganser	Duck	16-Oct-94	3

Fig. 8.26 The Query\_Count of Ducks Found Set

What you see on your screen should be the same as in Fig. 8.26—9 records, all of them from the *Duck family*, showing their Common Name, Date Sighted, and Count. Now you're ready to go ahead and create the *Count of Ducks Sighted Report*.

### Creating a Report based on the Query

**Close the Query\_Count of Ducks window and, in the Birds database window, in the Database frame at left, click on the Reports icon then, in the Tasks section click on Use Wizard to Create Report...** (Fig. 8.27)

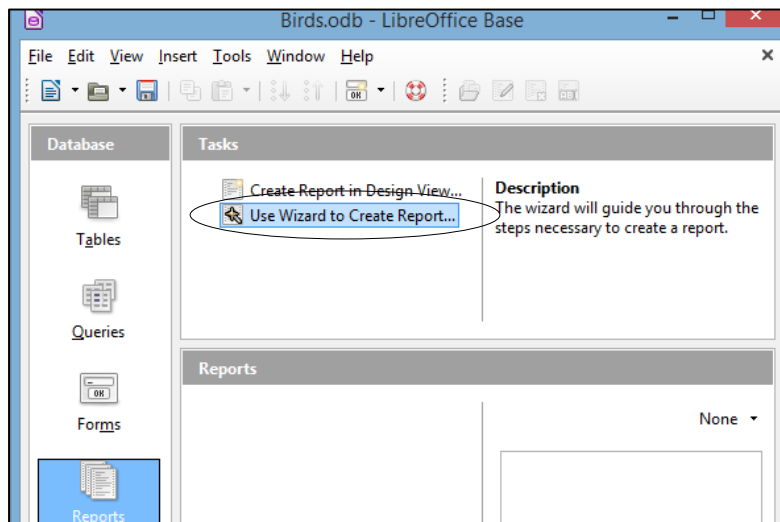


Fig. 8.27 Selecting the Wizard to create the report

This will bring up the Report Wizard dialog box (Fig. 8.28).

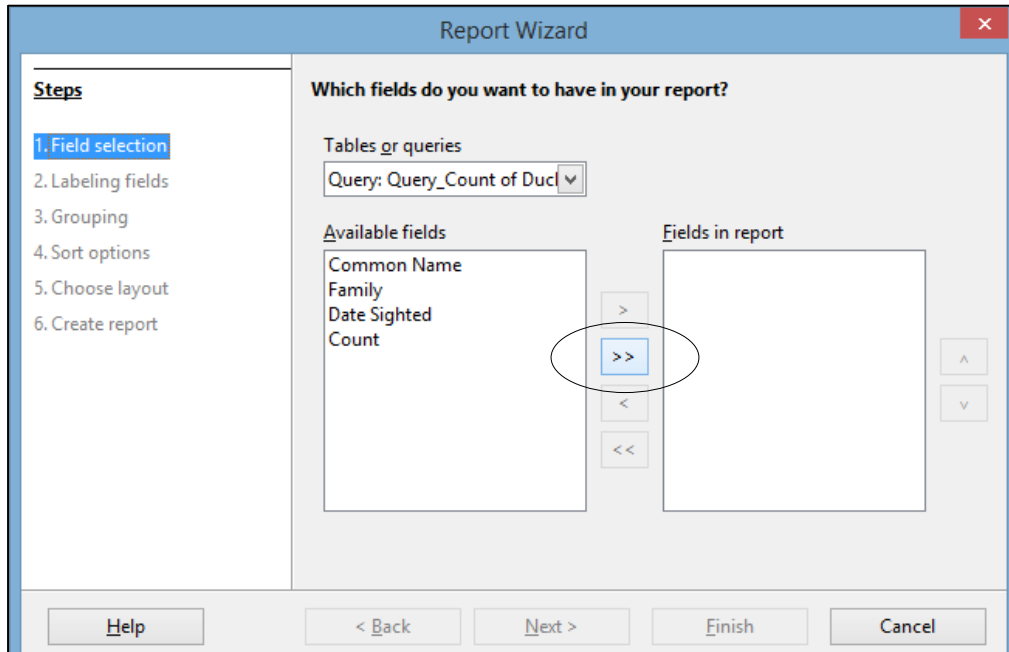


Fig. 8.28 The Report Wizard dialog box

In **Step 1** of the **Report Wizard**, in the **Tables or Queries** data box, leave the default **Query: Query\_Count of Ducks** as the source for the report's data

Then, in the list of **Available fields**, click on the **double arrow** (see Fig. 8.28 above) to move all **four fields** to the **Fields in report** box (Fig. 8.29), then click on **Next >**

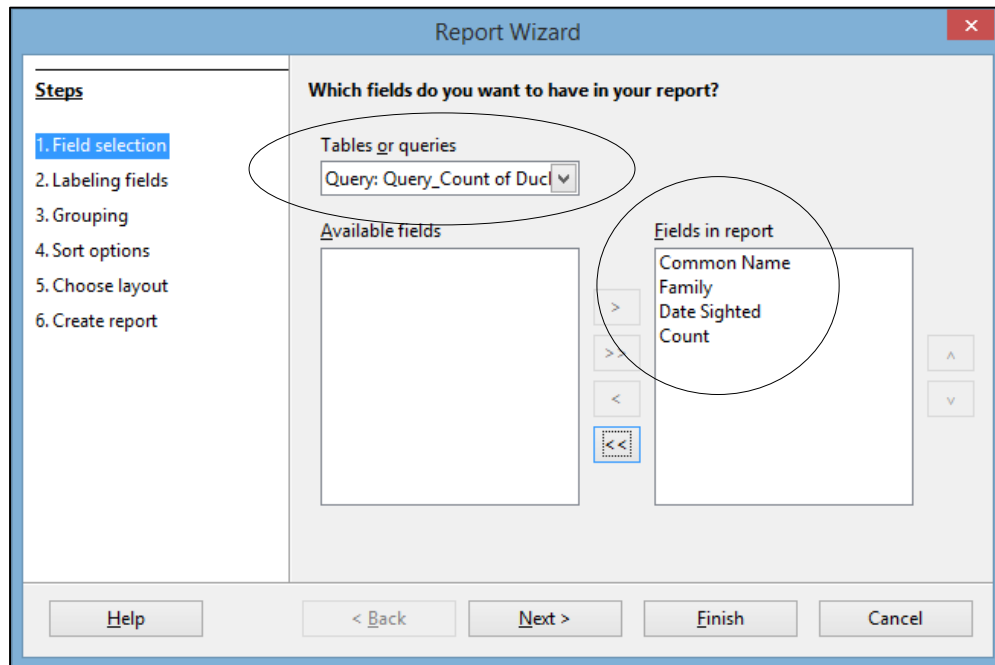


Fig. 8.29 Selecting the Fields for the report

This brings up Step 2 of the Report Wizard, where you are asked to decide how you want to label the fields for the report (Fig. 8.30)

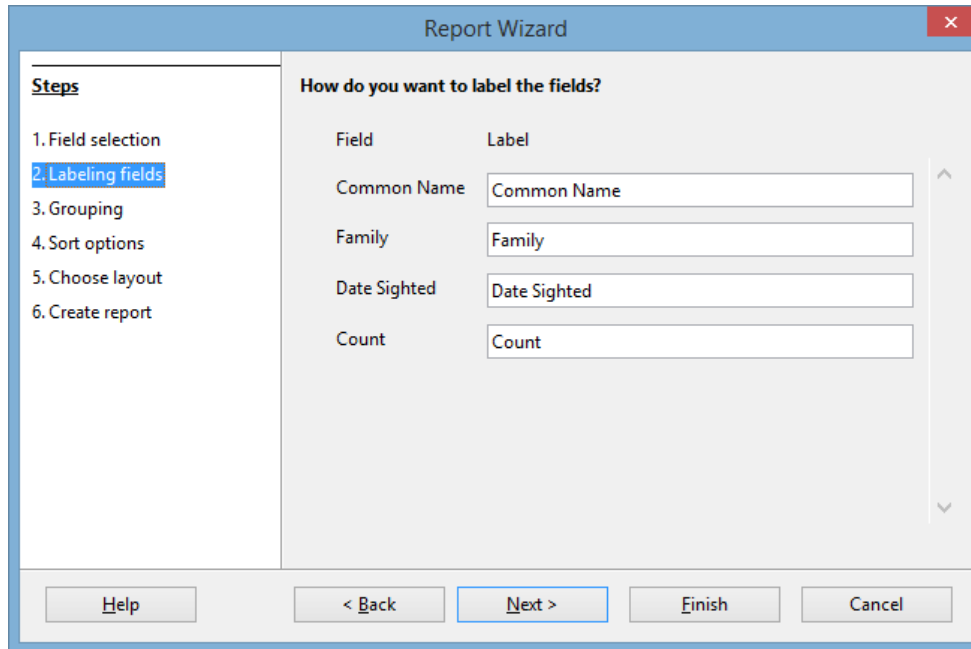


Fig. 8.30 Step 2 of the Report Wizard

The labels are fine as they are, so click on **Next >**

In Step 3 of the Report Wizard you are asked if you want to add grouping levels (Fig. 8.31).

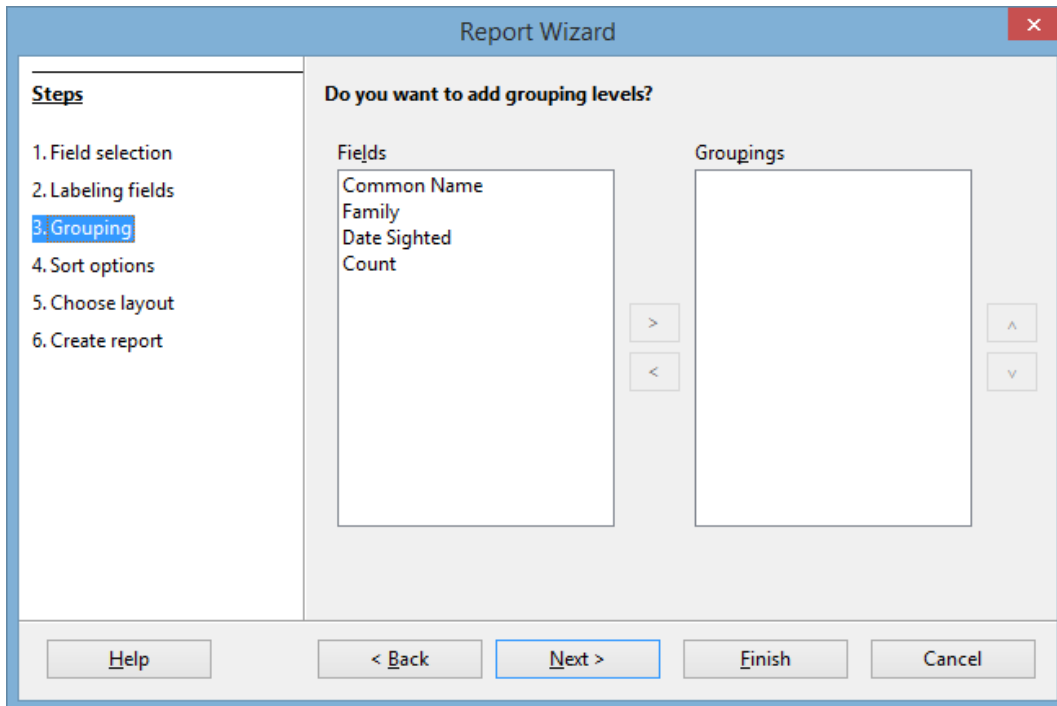


Fig. 8.31 Step 3 of the Report Wizard

Again there is no need to add grouping levels, so click on **Next >**

In **Step 4** you are asked if you want to **sort** the data in the database prior to producing the report, but you already sorted the data in an earlier exercise based on the **Common Name field**, and again, for practice, based on the **ID field**, so click on **Next >** to proceed to **Step 5** of the Report Wizard, where you are asked how you want to layout the data in the Report (Fig. 8.32)

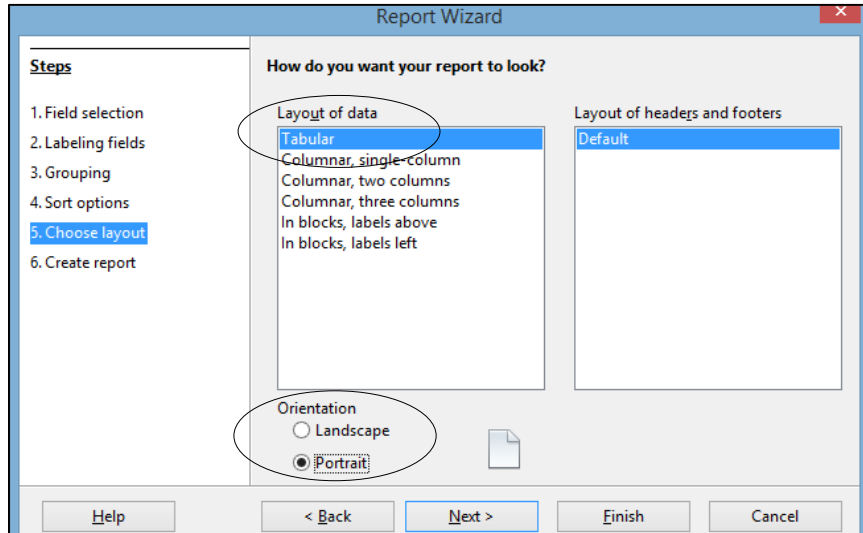


Fig. 8.32 Step 5 of the Report Wizard

**Tabular layout** is like a spreadsheet, where you have column headers with the data for each column listed below each of the headers, as in a Table, which is the default layout you want, so leave **Tabular** as the **Layout of data** option

You have four (4) fields in the report, and you can fit them across the **Portrait-oriented** page, so click on the **radio button** next to **Portrait** for the **Orientation** (Fig. 8.32 above), then click on **Next >** to proceed to Step 6 (Fig. 8.33)

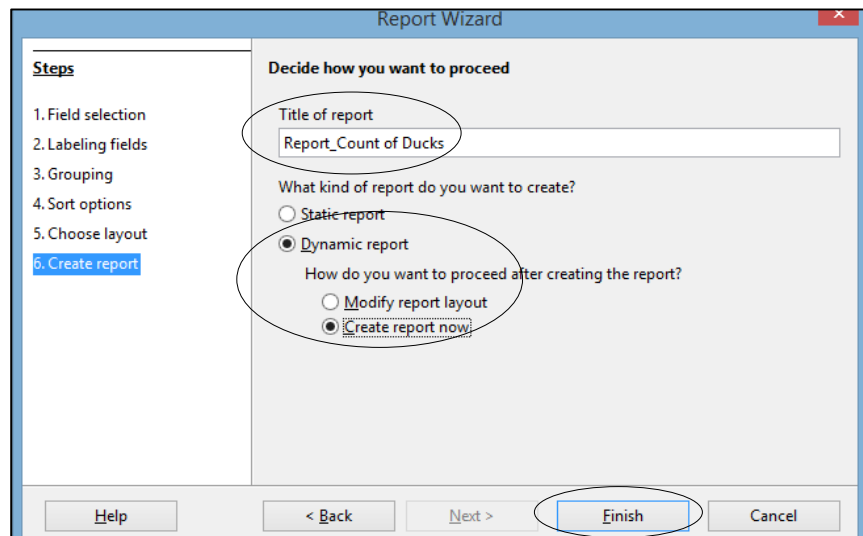


Fig. 8.33 Step 6 of the Report Wizard (Create Report)

In the **Title of report box** type the title: **Report\_Count of Ducks**



You want the report to be **Dynamic** so that the report will reflect changes to the data at a later date should the data in the database change, which is likely over time, so make sure the **radio button** next to **Dynamic** is checked (Fig. 8.33 above)

You also want to go ahead and have *LibreOffice* create the report after you click on Finish, so check the **radio button** next to **Create report now** (Fig. 8.33 previous page), then click on **Finish**

On the screen you should now see a rough and ready version of the report with column headers and, underneath them, the data for each column from the Found Set of Duck records (Fig. 8.34).

Common Name	Family	Date Sighted	Count
Redhead	Duck	01-Sep-93	6
Northern shoveler	Duck	01-Sep-93	8
Ring-necked Duck	Duck	01-Sep-93	2
Mallard	Duck	08-Sep-93	4
Gadwall	Duck	08-Sep-93	10
Green-winged Teal	Duck	08-Sep-93	3
Pintail	Duck	08-Sep-93	15
Canada Goose	Duck	01-Oct-93	25
Hooded Merganser	Duck	16-Oct-94	3

Fig. 8.34 Rough and ready version of the Count of Ducks report

Notice (Fig. 8.34 above) that the report is initially *read-only*—you can't actually interact with it and make any changes to it as is. There are a couple of ways that you can work on the design of the report to make it more meaningful and visually appealing. The first is to use the Report Builder.

**Close** the **Read-only** version of the report then, in the **Birds database** top level window, make sure the **Reports** object is selected in the left hand **Database frame**, and **right click**, in the **Reports** section, on the **Report\_Count of Ducks** report to bring up the **context menu** (Fig. 8.35)

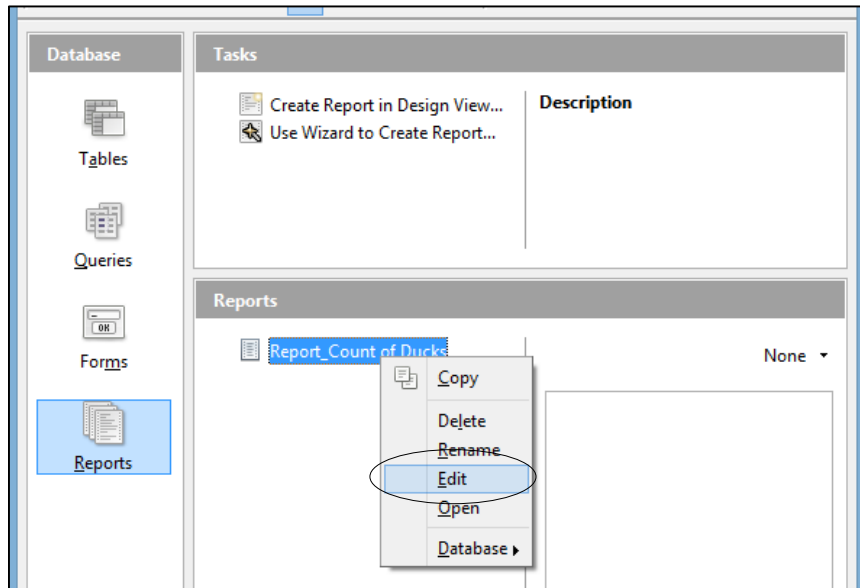


Fig. 8.35 The context menu for the Report\_Count of Ducks

In the **context menu** select **Edit**, which brings up the **Count of Ducks** report in the **Report Builder** (Fig. 8.36)

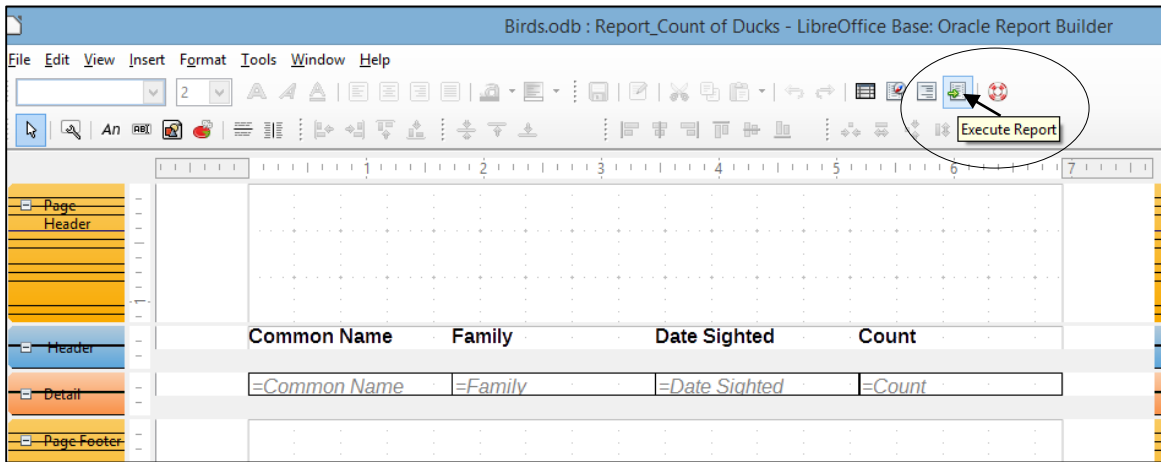


Fig. 8.36 *LibreOffice* Report Builder

The Report Builder has all the tools you need to work with the report and eventually come up with a layout and design that is both meaningful and pleasing to the eye. The report is essentially a *Writer* document that contains the data from the database. If you were to use the Report Builder to complete the design of the report, you would switch back and forth from the Report Builder to the work-in-progress *Writer* document by clicking on the *Execute Report icon* in the Standard toolbar, as illustrated in Fig. 8.36 above. Let's try this now.

In the **Standard toolbar**, click on the **Execute Report** icon to quickly bring up the rough and ready version again, which still looks much the same as Fig. 8.34 on the previous page

However, depending on the version of *LibreOffice* you have installed on your computer, the Report Builder is unfortunately not necessarily the best tool to use to complete the design of the report. For this reason, you would be as well advised to work directly with the rough-and-ready version, using the tools that you have already learned about in *LibreOffice Writer* in Lessons 1, 2, 3 and 7 of these tutorials.

The rough-and-ready version of the report should be open on your screen, and in order to edit the report click, in the Standard toolbar, on the **Edit File** icon (Fig. 8.37)

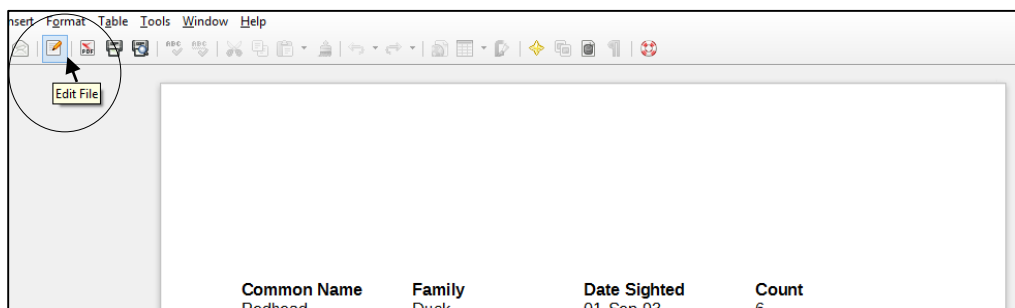


Fig. 8.37 The Edit File icon in the Standard toolbar

Your goal now is to work with the report until you can create something close to the version displayed in Fig. 8.38.

<b>Common Name</b>	<b>Family</b>	<b>Date Sighted</b>	<b>Count</b>
Redhead	Duck	01-Sep-93	6
Northern shoveler	Duck	01-Sep-93	8
Ring-necked Duck	Duck	01-Sep-93	2
Mallard	Duck	08-Sep-93	4
Gadwall	Duck	08-Sep-93	10
Green-winged Teal	Duck	08-Sep-93	3
Pintail	Duck	08-Sep-93	15
Canada Goose	Duck	01-Oct-93	25
Hooded Merganser	Duck	16-Oct-94	3

Fig. 8.38 The final version of the Count of Ducks Sighted Report

Here are some tips to help you along the way. But bear in mind that trial and error is the only way to end up with a final satisfactory outcome, so be patient and don't give up until you have something resembling the report in Fig. 8.38.

The column headers move independently of the data that is listed in each column. Let's start with the Column Headers. Fig. 8.39 shows a close up of what is involved with moving headers in the report.

<b>Common Name</b>	<b>Family</b>	<b>Date Sighted</b>	<b>Count</b>
Redhead	Duck	01-Sep-93	6
Northern shoveler	Duck	01-Sep-93	Adjust table column
Ring-necked Duck	Duck	01-Sep-93	2
Mallard	Duck	08-Sep-93	4
Gadwall	Duck	08-Sep-93	10
Green-winged Teal	Duck	08-Sep-93	3
Pintail	Duck	08-Sep-93	15
Canada Goose	Duck	01-Oct-93	25
Hooded Merganser	Duck	16-Oct-94	3

Fig. 8.39 Adjusting the position of headers in the report

Position the **tip** of the mouse pointer on the vertical line that divides the Count field from the Date Sighted field (the pointer becomes a **cross hair**), hold down the **left mouse button**, and slide the **Count header** to the **right** an inch or so (Fig. 8.40)

Common Name	Family	Date Sighted	Count
Redhead	Duck	01-Sep-93	6
Northern shoveler	Duck	01-Sep-93	8
Ring-necked Duck	Duck	01-Sep-93	2
Mallard	Duck	08-Sep-93	4
Gadwall	Duck	08-Sep-93	10
Green-winged Teal	Duck	08-Sep-93	3
Pintail	Duck	08-Sep-93	15
Canada Goose	Duck	01-Oct-93	25
Hooded Merganser	Duck	16-Oct-94	3

Fig. 8.40 The Count header moved over to the right

Now position the **tip** of the mouse pointer on the vertical line to the immediate left of the data in the Count column (the pointer becomes a **cross hair**), hold down the **left mouse button**, and slide the **set of data** to the **right** until it is more or less centered under the **Count column header** (Fig. 8.41)

Common Name	Family	Date Sighted	Count
Redhead	Duck	01-Sep-93	6
Northern shoveler	Duck	01-Sep-93	8
Ring-necked Duck	Duck	01-Sep-93	2
Mallard	Duck	08-Sep-93	4
Gadwall	Duck	08-Sep-93	10
Green-winged Teal	Duck	08-Sep-93	3
Pintail	Duck	08-Sep-93	15
Canada Goose	Duck	01-Oct-93	25
Hooded Merganser	Duck	16-Oct-94	3

Fig. 8.41 The Count data set centered under the Count column header

Now do the same with the **Common Name**, **Family**, and **Date Sighted** headers and data sets till you have them laid out much the same as illustrated in Fig. 8.38 on the previous page

Go to **File > Page Preview** to see how the page will look at this stage (it should look like Fig. 8.42), then click on **Close Preview** to continue working on the report design

Common Name	Family	Date Sighted	Count
Redhead	Duck	01-Sep-93	6
Northern shoveler	Duck	01-Sep-93	8
Ring-necked Duck	Duck	01-Sep-93	2
Mallard	Duck	08-Sep-93	4
Gadwall	Duck	08-Sep-93	10
Green-winged Teal	Duck	08-Sep-93	3
Pintail	Duck	08-Sep-93	15
Canada Goose	Duck	01-Oct-93	25
Hooded Merganser	Duck	16-Oct-94	3

Fig. 8.42 Report after adjusting the column headers and data sets

All that remains is the report header, where you are going to insert a Title and the date (see Fig. 8.39 on page 274 above).

Click anywhere in the **Header area** above the column headers (see Fig. 8.42 below—look carefully, and you’ll see the cursor flicking on and off in the top left corner of the header), then, in the **Standard toolbar**, change the **font** to **Liberation Sans**, the **font size** to **32 pt**, and click on the **Center** icon to center the title (Fig. 8.43)

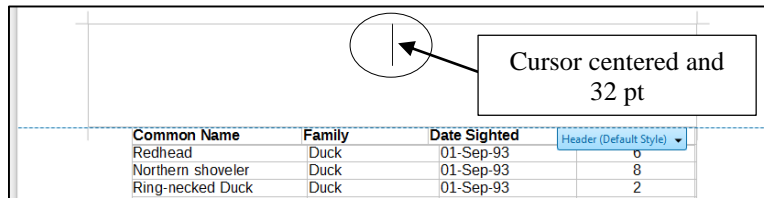


Fig. 8.43 Creating the title for the report

Go ahead and type the report title: **Count of Ducks Sighted**, hit the **Enter** key to move the cursor to a **new line**, change the **font size** to **14 pt**, and go to **Insert > Fields > Date**, then do **File > Page Preview** to check out the final product

If all went well, your report should now look very much like that illustrated in Fig. 8.38 on page 263. There are many more changes you could make to the report, such as adding graphics (maybe a picture of some ducks on a pond, for example) or background colors, and the like. If the report spanned several pages, you would almost certainly want to include page numbers (*Insert > Fields > Page Number*, which you learned about in Lesson 2). This is just an introduction to the topic of creating queries and reports. It is now up to you to extend your skills beyond these tutorials. Practice makes perfect, as you know so well.

## 8.6 PRINTING REPORTS

Once you have prepared the new report, it is a straightforward process to print the report. The command to do this is the same as you have used to print any other documents from within Microsoft *Office*, whether you have been working in Word Processing or the Spreadsheet.

You should still be in the **Page Preview window**, so click on the **Print** button in the **Standard toolbar** (Fig. 8.44) to print the **Count of Ducks Sighted** report

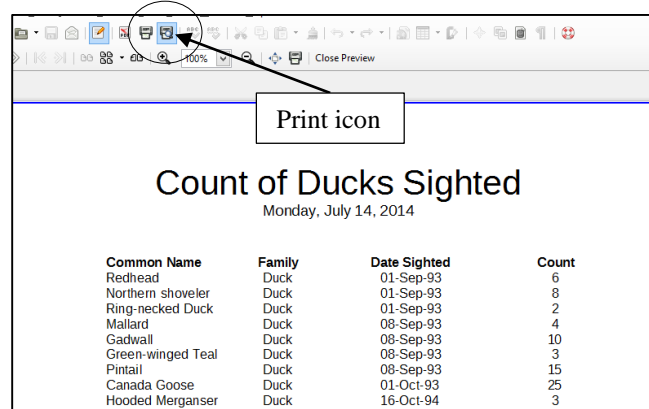


Fig. 8.44 The Print icon in the Standard toolbar

Remove the report from the printer and take a closer look at its contents. Notice that the only records in the report are those relating to ducks in the Family field. These are just a small subset of records drawn from the larger Birds database.

## LOOKING BACK

The *Base* database is a sophisticated tool for managing data. The key to success, as in so many activities, is PLANNING. Computers are wonderful tools to assist us in our professional lives, but only if we bring our intelligence to bear. The more skillful the user, the more powerful the impact of the computer on our professional and non-professional productivity.

You practiced three important skills of database management in this tutorial:

1. You learned how to search and query a database so that, no matter how large it might be, you could easily and quickly get the answers to any questions you might have. Getting answers to questions, research and so forth, is what creating electronic databases is all about.
2. You learned how to sort a database, and select out subsets of records.
3. You learned how to create and print new layouts or reports based on the data in a database.

Perhaps you have already learned about the value of database management systems such as *Base* in the educational process. Databases are the electronic storage bins for knowledge. Today they are both local and global in scope. More and more data is becoming available for on-line research. In time, maybe 50 years from now, maybe less, all knowledge will be accessible electronically. In the meantime, as teachers we should become aware of just what is available to our students, and do what we can to educate them to take advantage of information services of all kinds.

The role of teachers is changing. We are no longer the source of all knowledge. Rather, we are "knowledge brokers," intermediaries between our students and the source of the data they need so that they can "grow in wisdom and knowledge." As someone has observed, "Teachers should move away from being sages on the stage, and become, instead, the guides at the side."

## LOOKING FORWARD

There is more to learn about the *Base* database. It is beyond the scope of this book to cover all of the features of the software. However you have certainly learned the fundamentals and have the tools now to make a database work for you and for your students. The exercises that follow in the SKILL CONSOLIDATION section will help you reinforce the knowledge you have gained.

"Practice makes perfect" is as true of computer use as it is of any other skill-based activity like playing tennis or baking a cake. So is that other saying: "Use it, or lose it." You can probably identify many examples from your own experience where skills you were once proud to have mastered have become 'rusty' for lack of use. Likewise, you will quickly forget what you are learning in these tutorials unless you resolve to continue to apply the lessons learned on a regular basis, either for your own work or in the context of the classroom.

The best teachers will use all the help they can get. The purpose of these tutorials continues to be to sharpen your skills in the use of one of the most powerful classroom tools yet devised—the electronic computer. You are to be congratulated for having persevered thus far. The remaining two tutorials will help you integrate the skills you have learned, and hopefully spur you on to a

commitment to continue to incorporate the computer into your professional life both for your own sake and for that of your students.

## SKILL CONSOLIDATION

Complete as many of these exercises as you can to reinforce what you learned in Lesson 8.

1. Work with a group of your colleagues or classmates to specify and create a series of reports to accompany a database of student data such as the Roster Template database that you created in Lesson 6. Save the template with the set of reports.
2. From the Work Files for *LibreOffice* folder on your USB drive, open the Roster 2008 database onto the Desktop.
  - Add a record
  - Change the address and phone # in an existing field
  - Arrange the records chronologically on date of birth
3. Create a new database (do not use a database you already created) on any topic of your choosing.
  - Design the fields (at least 10) to be included in the database
  - Save the empty database document
  - Add at least 20 records
  - Save the database document again
  - Prepare a report using just 5 of the fields in the database
  - Save the database with the report and send the database to your professor as an attachment in email
4. Open the Birds database (in the Practice folder on your Work Disk) onto the Desktop.
  - Find all the birds that have *blue*, *grey*, *green*, or *olive* in their *Color1* plumage
  - Arrange (Sort) the birds in *descending order* (reverse alphabetical order—from Z to A)—the *Birds*, not the Colors!
  - Prepare a report using just the following 5 fields in the database: *Common Name*, *Family*, *Color1*, *Habitat*, *Count*
  - Save the *Birds* database with the report and send the database to your professor as an attachment in email