

ICDL Module 5: Databases

using

OpenOffice.org Base

David Varley

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Module 5: OpenOffice.org Base

Section 1: Using the Application

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5.1 Using the Application

5.1.1 Database Concepts

5.1.1.1 Understand what a database is.

In an office application suite, the different applications have different areas of focus. In the case of word processors, the focus is on documents. In spreadsheets, the emphasis is on calculation. In the case of databases, the focus is on working with information.

Data and information

A word that is related to information is data. Data refers to a collection of unorganised facts. A collection of data may contain millions of items. When we make sense out of the data through manipulating it in some way, we say that we have information. In other words, information is data that has been made intelligible.

Turning data into information

The purpose of a database system is to store the data and turn it into information. This involves a number of processes. Some of these are:

- Storage and retrieval.
- Sorting.
- Performing numerical analysis on the data such as counting, averaging and summation.
- Filtering: Selecting on data that satisfies certain criteria.
- Reporting: Producing output in some standardised and readable format.

5.1.1.2 Understand how a database is organised in terms of tables, records, fields, and with field data types, field properties.

Data itself needs to be stored in a standard way so that the database can retrieve and manipulate it. There are a number of levels at which we can look at the storage of the data.

A **Table** is a collection of data related to a single topic and a **database** is a collection of tables. For example, a company human resource database may comprise a number of tables such as staff personal details, salary data, pension data, dispute data, academic, professional and training data, and medical scheme data.

Note that each table is related to a single topic. Where a table is found to contain data on more than one topic, it should be split.

If you studied database theory in depth, you would soon come across rules which have been formulated with the way databases should ideally be constructed. Technically, these are called the **rules of normalisation**. They are beyond the scope of our work.

A table is made up of a number of **rows** or **records**. In our examples above, each record or row of the staff personal details table would contain data on a specific employee.

The rows themselves are made up of a number of **columns** or **fields**. The fields in this example would include items such as name, first name, date of birth, place of birth, id number, marital status and so on.

Fields themselves can be of different types depending on the data they contain. In Base, these field types are:

- **Text:** Used for storing ordinary text such as names and addresses. Note that it should also be used for storing numbers on which you will not perform arithmetic operations. An example of the latter would be telephone numbers.
- **Memo:** Used for storing large amounts of text. For example, you could store paragraphs or whole documents in a memo field.
- **Number:** Used for storing any type of number. Only use number fields if you might need to perform arithmetic on the contents of the field.
- **Decimal:** Used to store numbers which contain a fractional part.
- **Integer:** Used to store whole numbers only.
- **Date:** Used to store dates. Date fields can have certain types of arithmetic operations performed on them. For example, if you subtract one date from another, you get the number of days between.
- **Boolean:** Used to store data which can only assume one of two values. Examples are Yes/No, True/False, 1/0.
- **Image:** Used to store photographs, signatures, etc.

There are a number of further field types as well as refinements of the fields mentioned above, but for the time being, the above list provides an idea of how fields can be typed.

5.1.1.3 Understand what a primary key is.

Each record should have one field that is unique and that can be used to distinguish one record from another. An example, could be a staff id number. This field is called the **primary key**.

Recall that each table contains data on a particular topic. To get a complete set of data on any individual, we would need to extract data from a number of tables. What we need is some way of being able to link the data in one table with the data in another. If we know an employee's staff id number, this can be used to identify the record in each table associated with that employee.

5.1.1.4 Understand what an index is.

An **index** refers to a field on which a database can be sorted. When you create a table, you specify whether or not you wish a field to be indexed. When you do, Base maintains a special structure in the background which allows the table to be rapidly sorted based on the indexed fields.

If you might sort a table on a field, you should index it. On the other hand, if you have too many indexed fields, the action of the database will be slowed down since the more indexed fields there are, the more work the database will have to do.

5.1.1.5 Understand the purpose of relating tables in a database.

Since each table contains data on only one topic, we need to be able to access corresponding data in different tables. This is done by setting up a relationship between tables.

One way of conceptualising this is as follows. Think of each table as having a pointer. This pointer marks the currently active record. If we have a table open, then the current record displayed is the one being pointed to. As the pointer moves through the records of the current table, other pointers move through the corresponding records of the other tables. These are open, but are in the background. The process by which this takes place is the relationship that is established between the tables.

5.1.1.6 Understand the importance of setting rules to ensure relationships between tables are valid.

One of the problems that we have to face when working with tables that are linked as mentioned above is that we might try to enter data that is inconsistent.

To prevent this, we set up **integrity rules**. These effectively prevent us from entering inconsistent data.

Suppose two tables are linked, one aspect of referential integrity would prevent us from entering data into one table which, for some reason, could not be linked with data in another table.

Another aspect of referential integrity is **cascading**. If a record in one table is deleted, then the corresponding records in the other linked tables will also be deleted. This is called **cascading delete**. Related to this is the **cascaded update**. If the data in a field in one table that appears in another is altered, then the corresponding field in the other table will also be altered.

If we did not have these integrity rules, then very quickly we would have inconsistent data in which the same fields in different tables contain different data.

5.1.2 First Steps with Databases

5.1.2.1 Open (and close) a database application.

Open Base under Windows

- Click **Start**.
- Click **Programs**.
- Click **OpenOffice.org**
- Click **OpenOffice.org Base**

Open Base under Linux

- Click **Start Applications**.
- Click **Office**.
- Click **Presentations**.
- Click **OfficeOffice.org Base**

Convention

Because we will be making extensive use of the **Menu bar**, we will make use of the following convention in using the functions of the menu bar.

- **File » Close.**

Will mean exactly the same as

- Click **File** on the **Menu bar**.
- Click the **Close** option in the menu.

5.1.2.2 Open, log onto an existing database.

Suppose we have a database with a pathname such as D:\DATABASES\AFRICA (Windows) or /DATABASES/AFRICA (Linux):

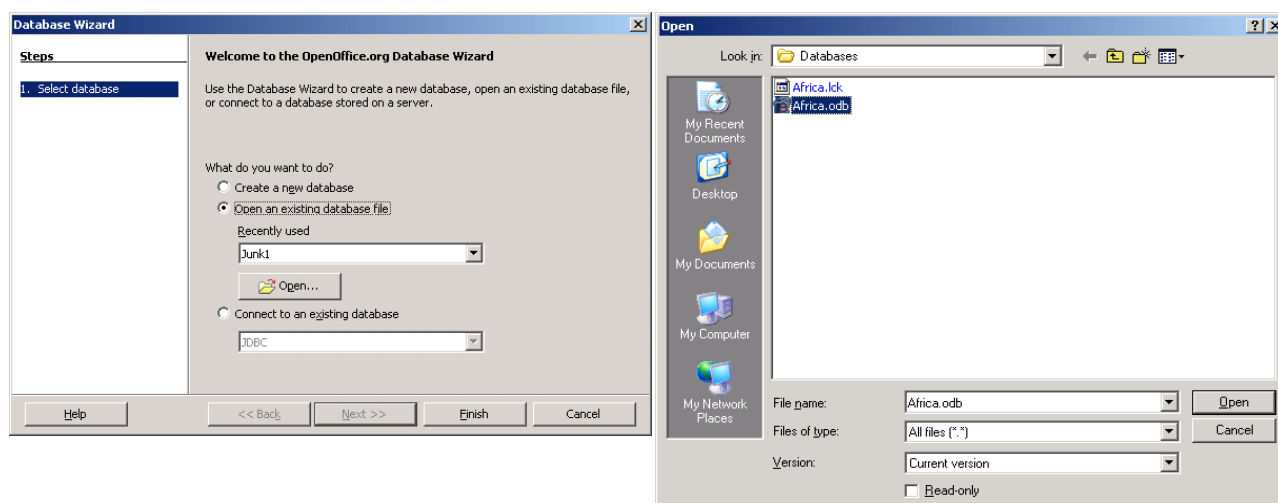
- Follow the initial steps set out in the previous section.
- You will be prompted for a new or existing database. Check the **Existing database** radio button.
- Click the **Open** icon.

This will display the **Open File** dialogue. This dialogue is shown below for Windows systems. The Linux dialogue will be similar.

If you already have an OpenOffice.org application open, for example a Writer, Calc or Impress application:

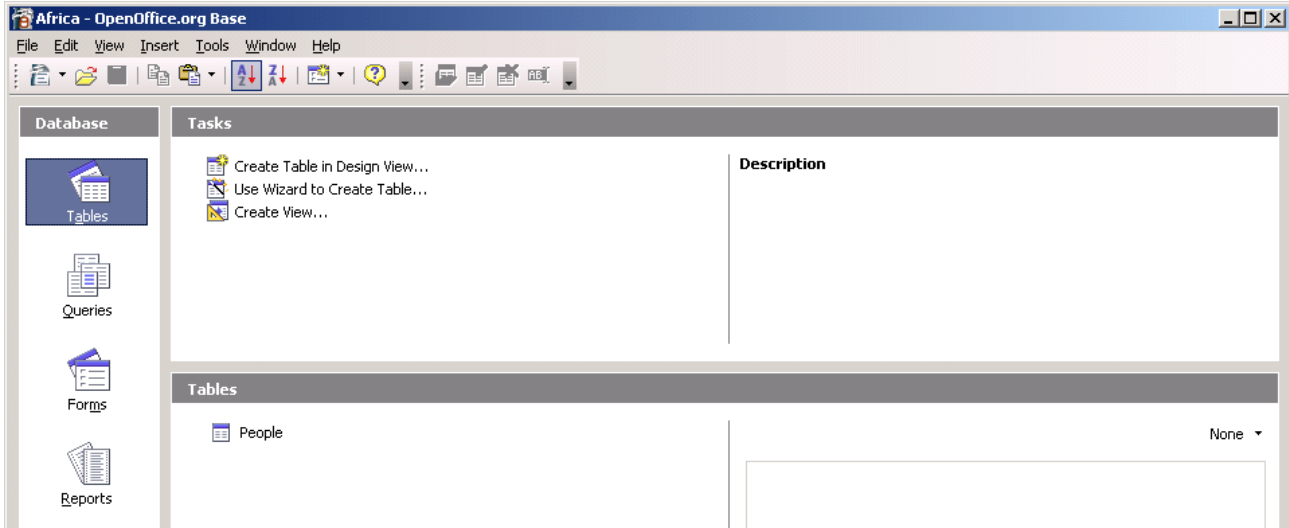
- **File » New.**

This will take you directly to the **Open File** dialogue.

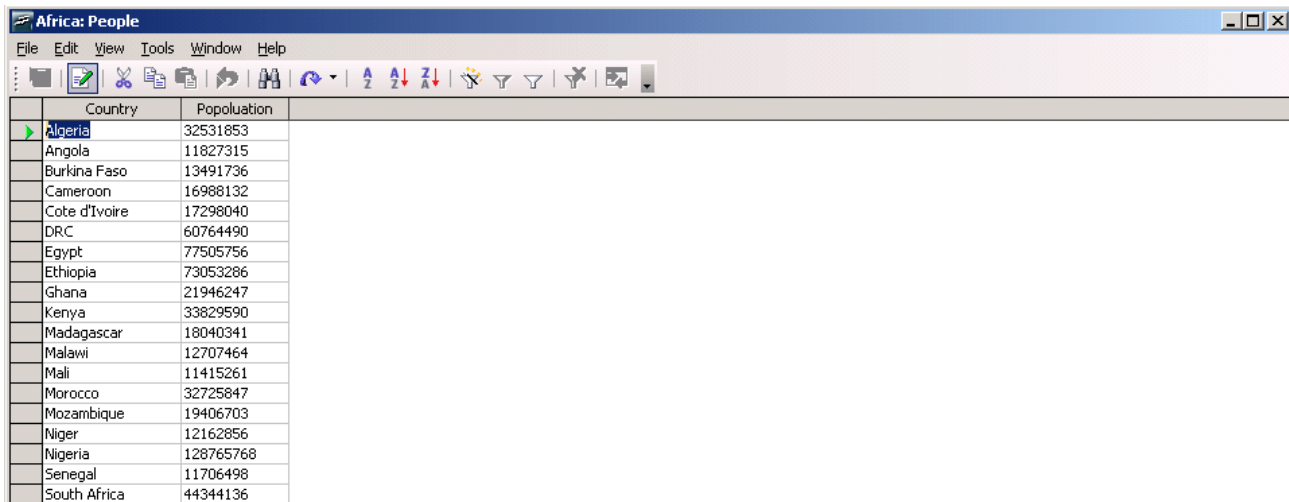


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- Located the directory (folder) in which the database is located and highlight the database.
- Click **OK**.
- Click **Tables** in the left hand (**Database**) pane.



- Click a table in the **Tables** pane. In this case, we click the table called **People**.



Country	Population
Algeria	32531853
Angola	11827315
Burkina Faso	13491736
Cameroon	16988132
Cote d'Ivoire	17298040
DRC	60764490
Egypt	77505756
Ethiopia	73053286
Ghana	21946247
Kenya	33829590
Madagascar	18040341
Malawi	12707464
Mali	11415261
Morocco	32725847
Mozambique	19406703
Niger	12162856
Nigeria	128765768
Senegal	11706498
South Africa	44344136

In the above case, the table is extremely simple. It consists of only two fields called **Country** and **Population**.

As a matter of interest, all the figures that are used in this example and those that follow are real life figures extracted from the **CIA Factbook**. If you wish to have access to all the data with a view to constructing more extensive databases based on actual data, it can be downloaded free of charge from www.cia.gov/cia/publications/factbook/

To close the database:

- **File » Close**

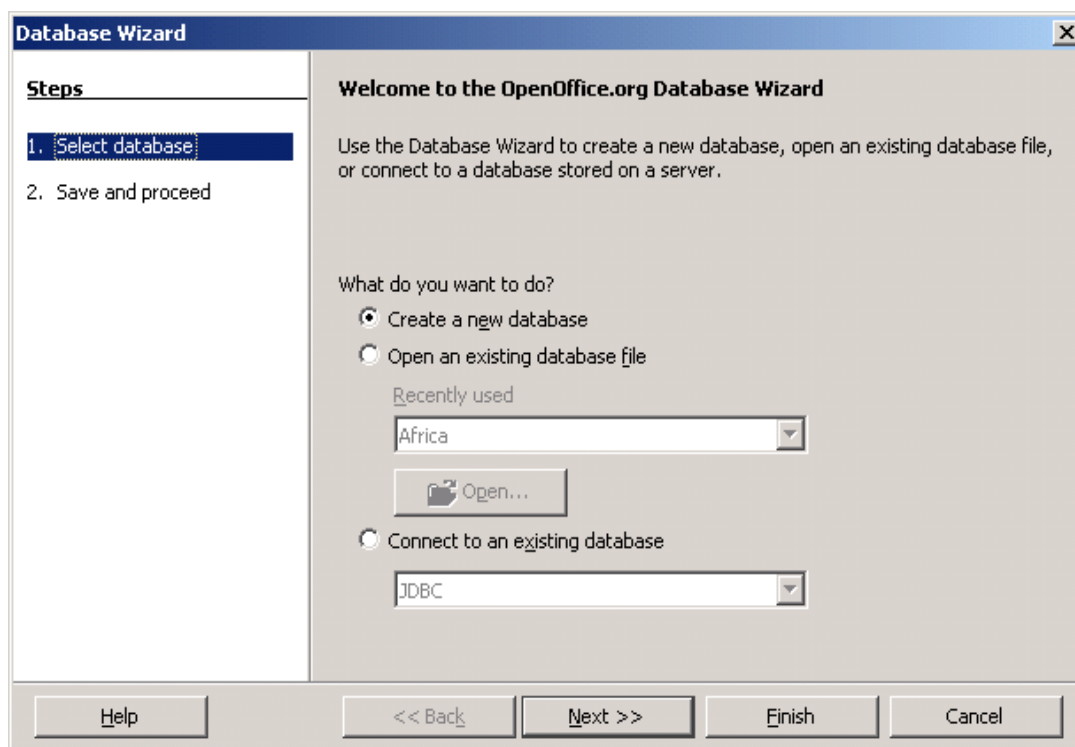
and to exit the application completely:

- **File » Exit**

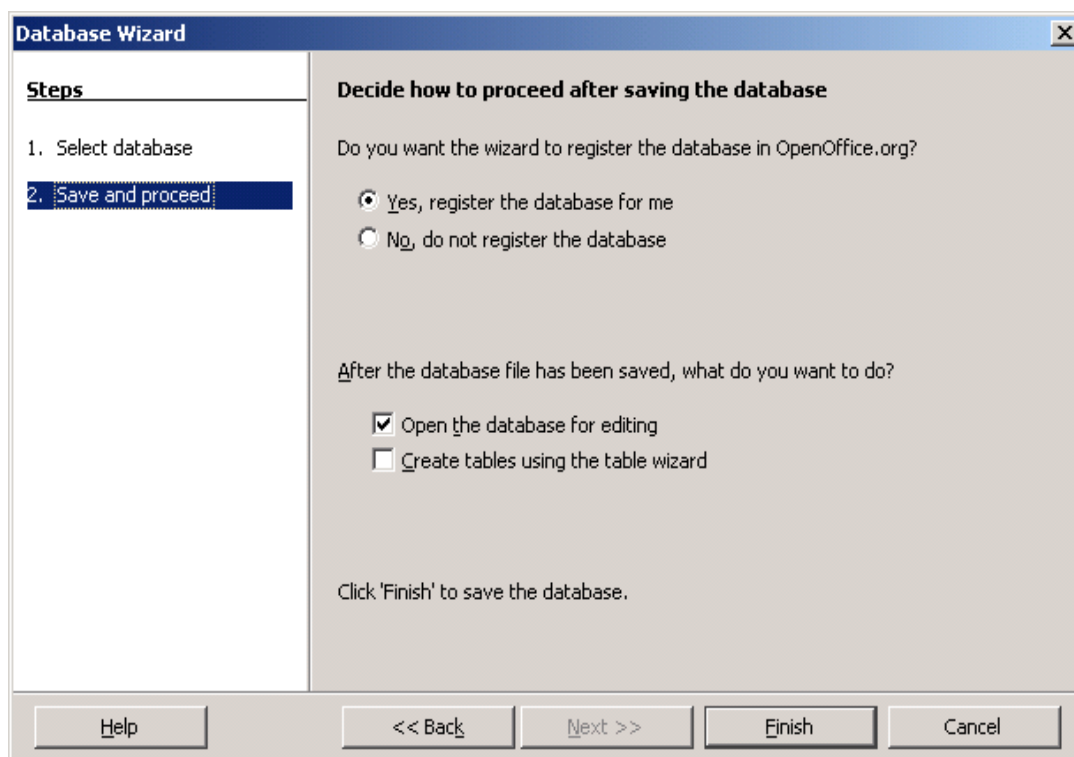
5.1.2.3 Create a new database.

We will now go through the steps to create the simple database that was illustrated previously.

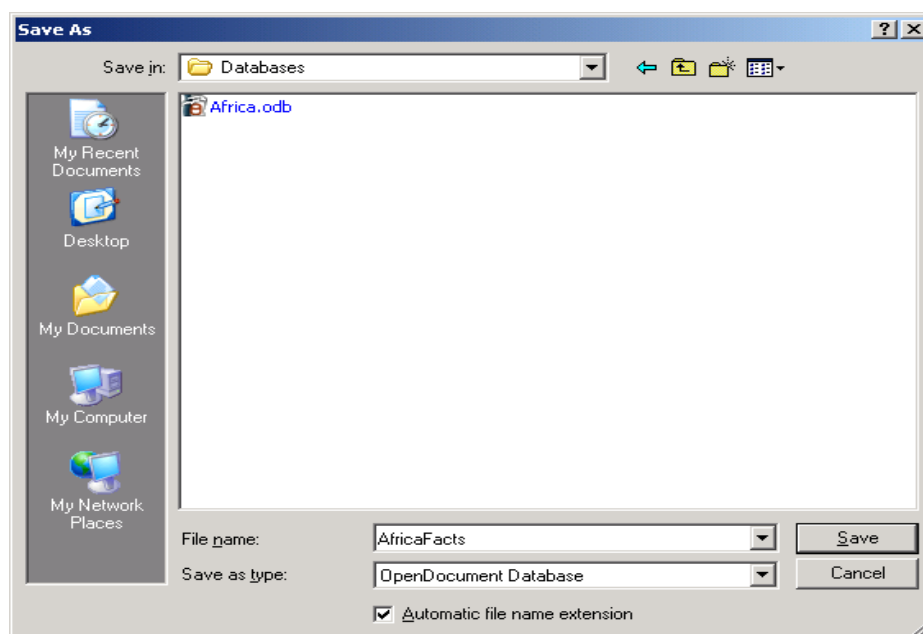
- Create a directory in which to save your databases. This could be D:\DATA\DATABASES (Windows) or /HOME/DATABASES/ (Linux). The actual paths would depend on how your system is set up.
- Proceed through the steps detailed in section 5.1.2.2 to open Base until the following screen is displayed:



- Make sure the **Create a new database** radio button is checked.
- Click **Next**.

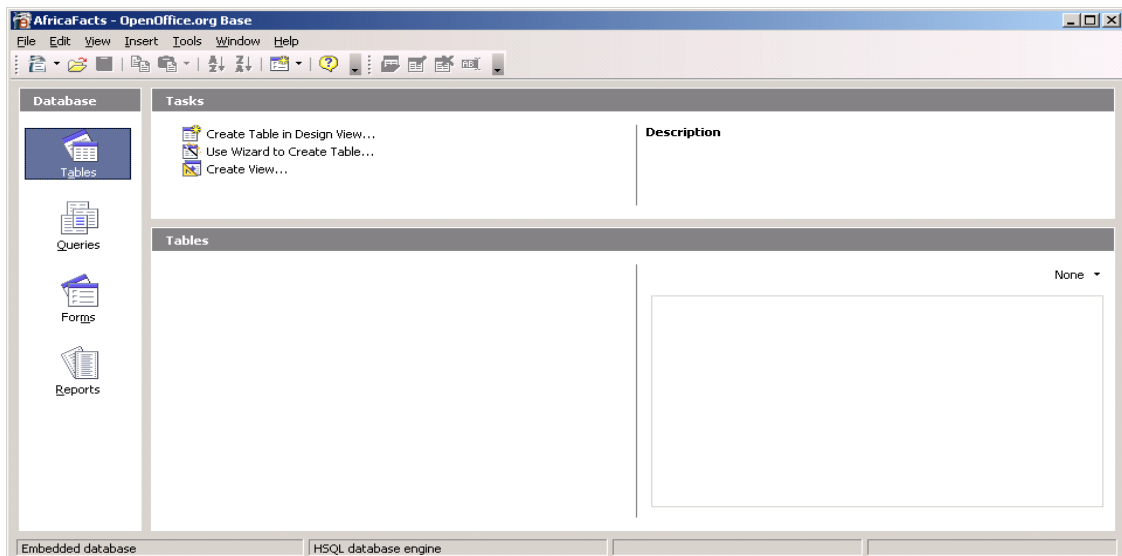


- Click **Finish** as there is nothing we need to change on this screen.
- You will now be prompted for a name of the database and a location win which to save it.



- Select a location and enter a file name.
- Press **Save** when done.
- Press **Tables** in the **Database** pane on the left.

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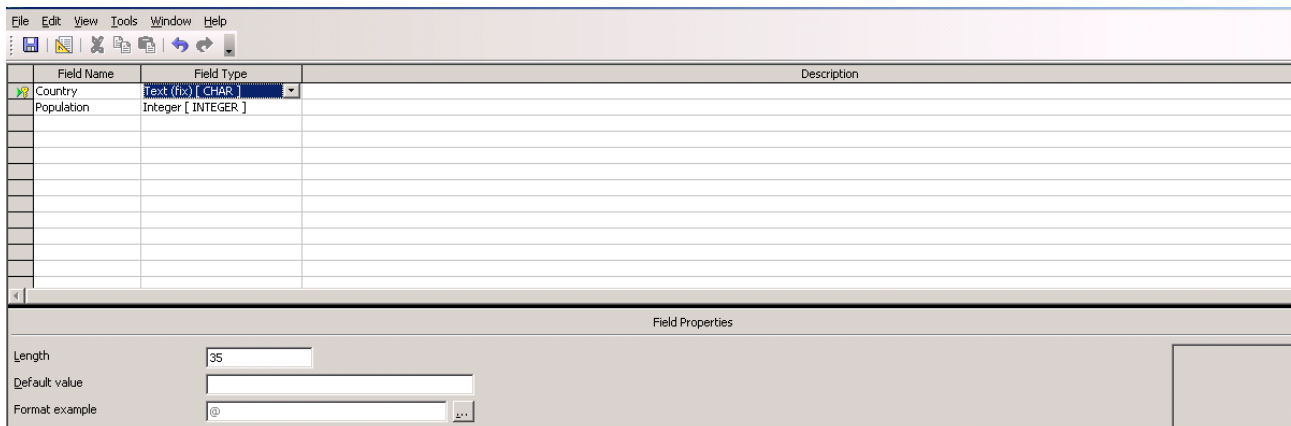


As a database is made up of a number of tables, we need to start by constructing a simple table.

- Click **Create Table in Design View** in the tasks pane, the upper left pane.

The screen that appears allows you to create the fields of the database. Each field is given a name and a type. The field types are selected by clicking on the drop down arrow. This displays the various options.

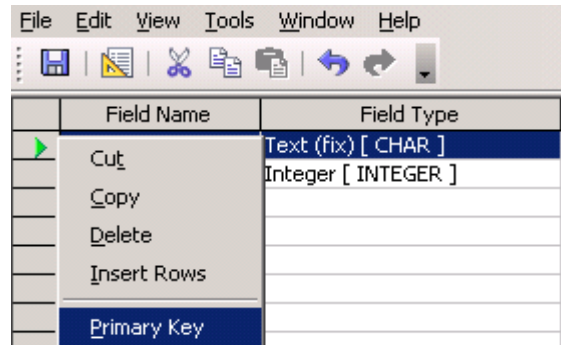
- Create a field called **Country**. Select **Text (Fix) [CHAR]** as its type.
- Create another field called **Population**. For its type, select **Integer**.



Important: Do not use **Text [VARCHAR]** as the field type as this will create problems when we use the field in a relation. (Variable Characters – may change).

- Click on the left hand side of the first field, **Country**, to select it.
- Right click to display a **Contextual menu**
- Select **Primary key**.

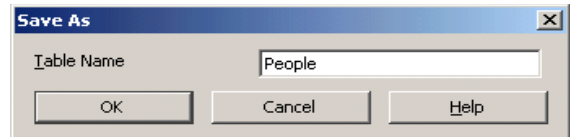
Recall each table should have a primary key that will be used to provide a unique identifier for each record.



Note that a small key will be displayed next to the field name. This indicates that it is the primary key for the table.



- **File » Close.**
- Enter **People** as the table name.
- Click **OK.**
- **File » Close.**



The reason we had to repeat the **File » Close** is because the table did not yet have a name.

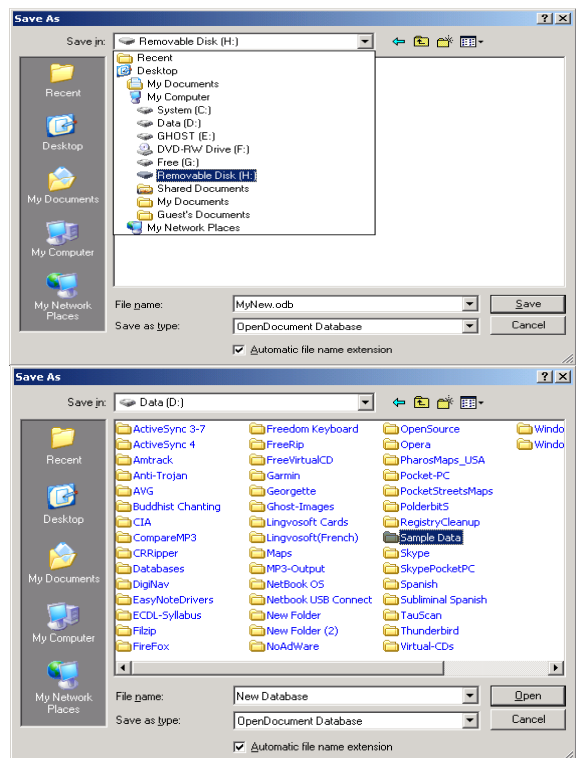
The creation of tables and data entry will be covered in detail in the next chapter. The purpose of this section was to give you a feel of the way in which databases are constructed.

5.1.2.4 Save a database to a location on a drive

As mentioned in the section 5.1.2.3, when you create a database, you will be asked for a name and a location in which to save it. In the case of a Windows system, you will need to select a device such as a hard drive, floppy drive, CD or flash disk.

- Select a device.
This will displays a directory structure for the device.
- Double click on a location in the directory tree.
- Click **Open.**

In the case of **Linux** systems, you are immediately presented with a directory tree as all devices are located at branches in the tree.



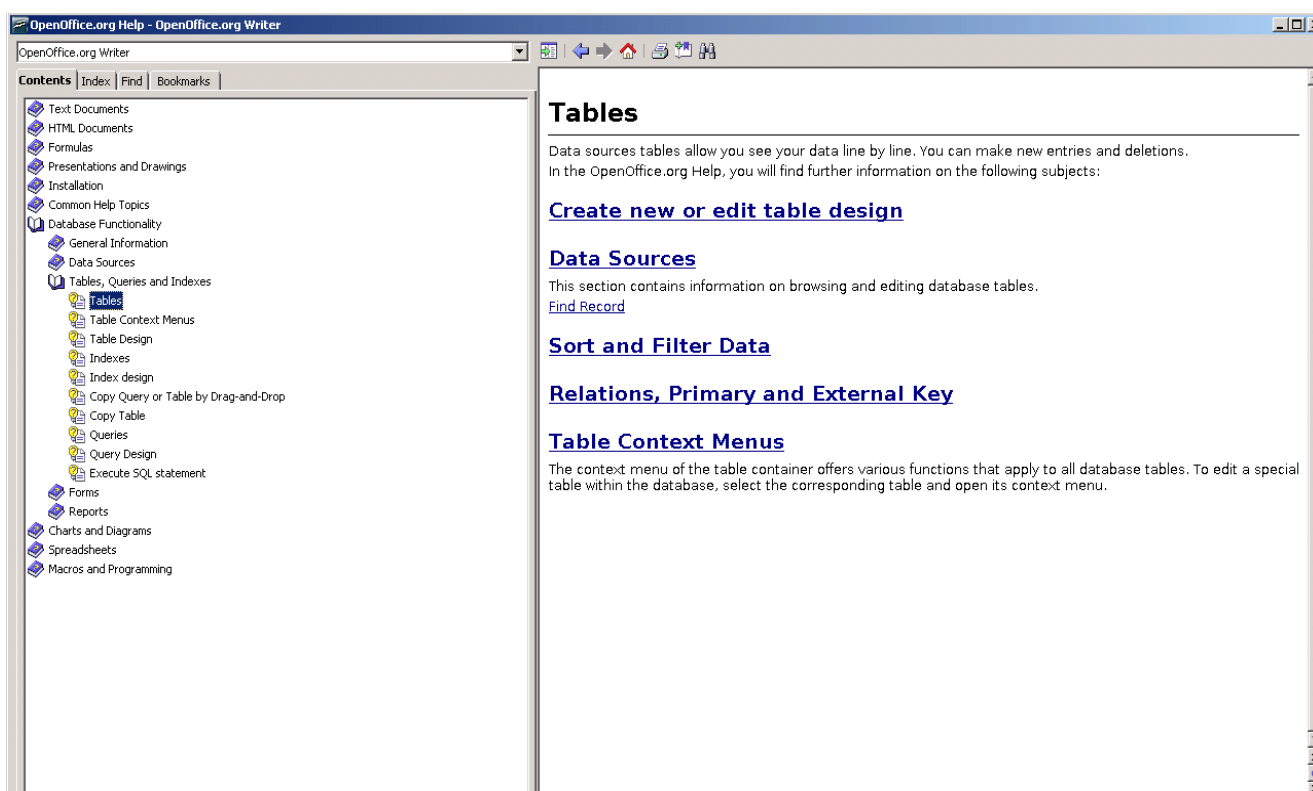
5.1.2.5 Use available Help functions.

The help system of OpenOffice.org provides a complete reference to the system.

Contents

- **Help » OpenOffice.org Help.**
- Click on the **Contents** tab.

This accesses the help system of OpenOffice.org, not just Base.



- Click on the **Contents** tab.

Each book represents a major section.

- Double click on any book icon, for example **Database Functionality**. This will display the contents which may be further subsections or actual entries.
- Double click on a section, for example **Tables, Queries and Indexes**.
- Double click on a subsection, for example **Tables**. The right hand pane will contain a detailed description of the topic.

This example is illustrated in the previous screen.

Index

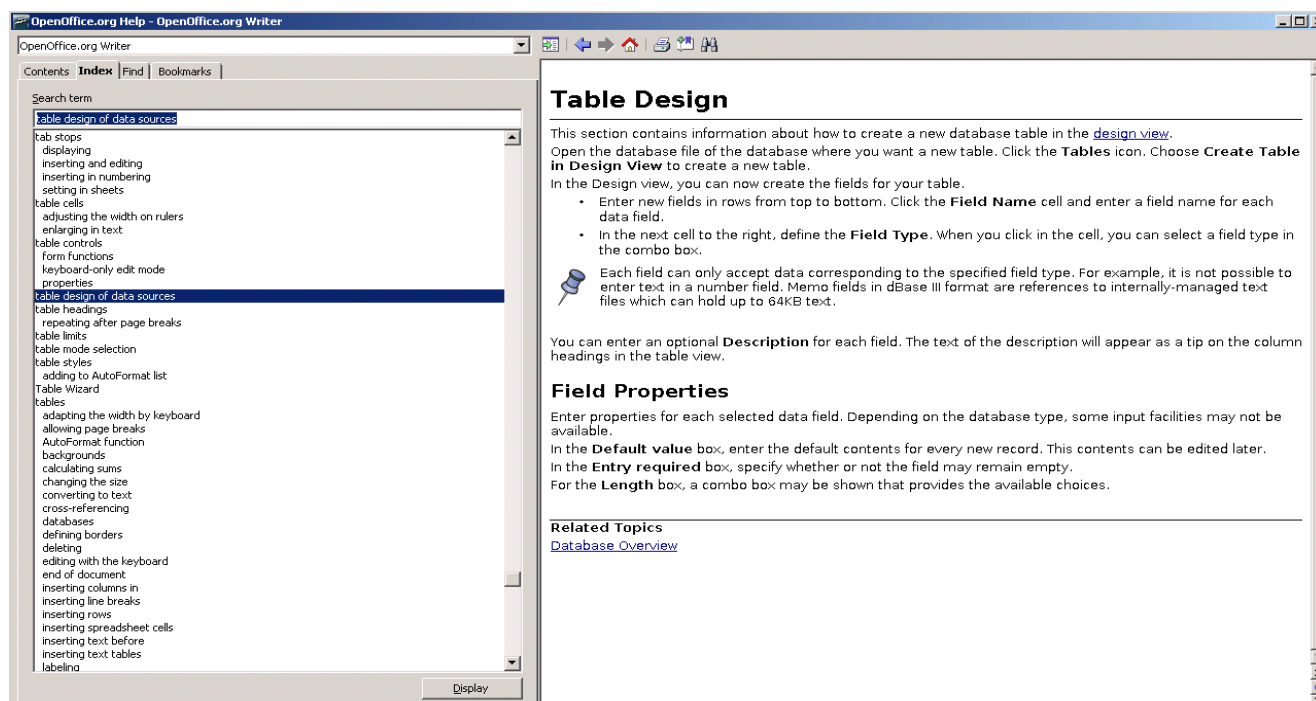
The **Contents** tab is the same as the table of contents at the front of the book. This organises entries by function.

The **Index** tab functions in the same way as the index at the back of the book. This provides an alphabetic listing of topics.

- Click on the **Index** tab.
- Begin typing a term that you are interested in into the **Search term** window. Type for example the word **table**.

OpenOffice.org will attempt to anticipate what you are searching for. As you type in the **Search term** window, the alphabetic listing of topics will change. The entries are divided into headings and actual topics. The headings are flush against the left hand side of the pane while the actual topics are slightly indented.

- Double click on an entry. For example, click on **Table design of data sources**.



The right hand pane contains the details of the topic you have selected.

Within the details of the entry you will also see a number of hyperlinks. These are underlined in blue. These are references to related topics. To jump to one of these entries, double click the hyperlink.

Find

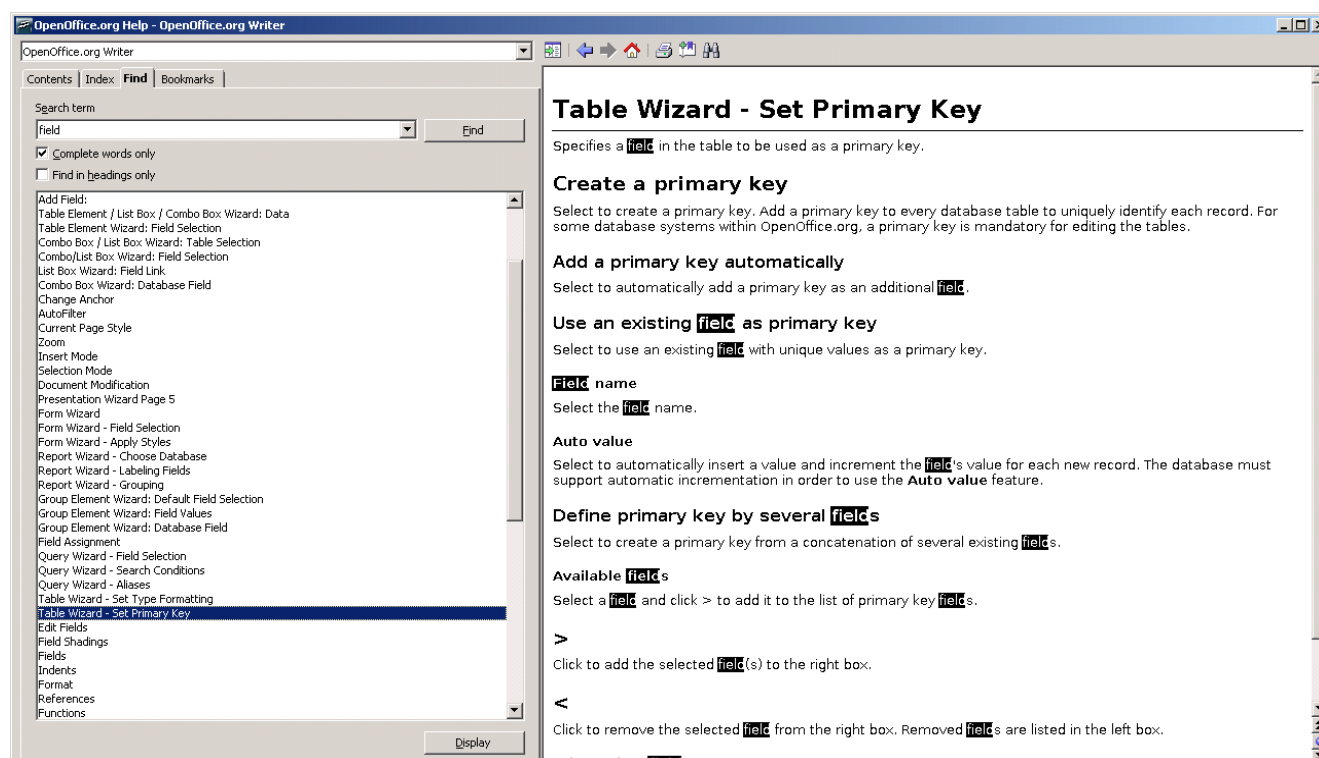
OpenOffice.org provides yet another method of searching for information. Whereas both **Contents** and **Index** are based on an alphabetic listing of topics, **Find** allows you to search within the text of the entries for topics using a keyword.

Suppose you did not find the previous description of the term **field** adequate and you wish to find all topics in OpenOffice.org that make reference to this term.

- Click on the **Find** tab.
- Type the work **field** into the **Search term** window.
- Click **Find**.


A list of entries that contain the word **field** are displayed.

- Double click on the entry that you wish to read.




The occurrences of the search word are highlighted in the details window.

Print entries in Help

- Click the print icon, .

Create bookmarks

When you read a book you may sometimes turn the corner of a page to mark important pages for easy later reference. A bookmark is the electronic equivalent.

- Click the create bookmark icon, , to mark an entry.
- Enter a name for your entry in the **Add to bookmarks** dialogue.
- Click **OK**.

Use bookmarks

- Click on the **Bookmarks** tab.

A list of bookmarks you have created will be displayed.

- Double click on an entry to read the details.

5.1.2.6 Close a database.

This was covered in section 5.1.2.2

5.1.3 Adjust Settings

5.1.3.1 Change between view modes in a table, form, report.

The **Database** pane on the left hand side of the screen provides access to various views on the data in the database.

Table provides a view on the basic data storage unit for records. The table view looks much the same as a spreadsheet. Each record is represented by a row of the table while the columns represent the fields.

Queries look much the same as tables. The records however, may be selected on the basis of one or more criteria. In addition, the fields maybe extracted from more than one table.

Forms represent formatted data from tables and queries.

Reports are summaries of data extracted from forms and queries. They may contain additional calculations and text added to make the output readable. Reports are generally designed to be printed out.

These views are illustrated below.



Country	Population
Algeria	32531853
Burkina Faso	13491736
Cameroon	16988132
Cote d'Ivoire	17298040
Ethiopia	73053286
Ghana	21946247
Guinea	9452670
Kenya	33829590
Madagascar	18040341
Malawi	12707464
Mali	11415261
Morocco	32725847
Mozambique	19406703
Niger	12162856
Nigeria	128765768
Rwanda	8440820
Senegal	11706498
South Africa	44344136
Sudan	4187486
Tanzania	36766356
Uganda	27269482
Zambia	11261795

Record 1 of 22

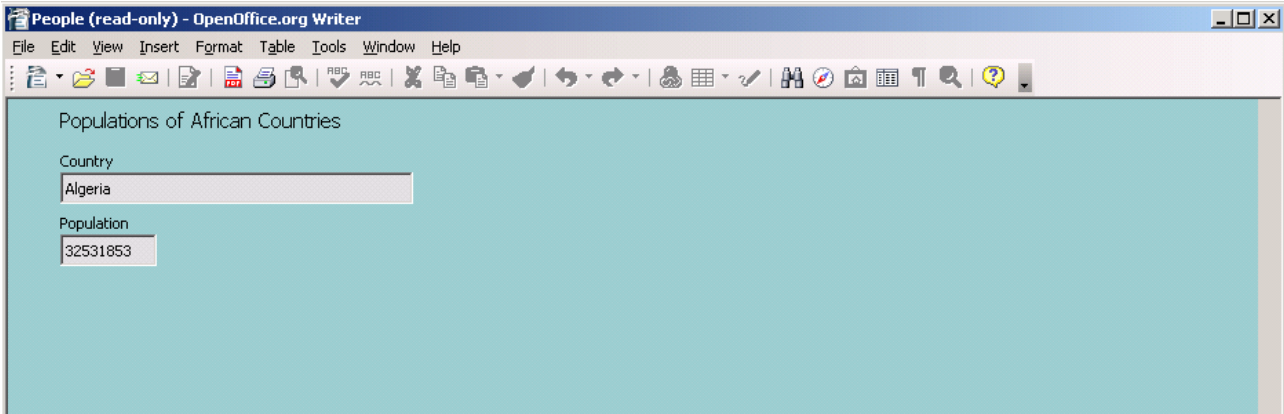
Table view

Country	Population
Ethiopia	73053286
Nigeria	128765768
South Africa	44344136

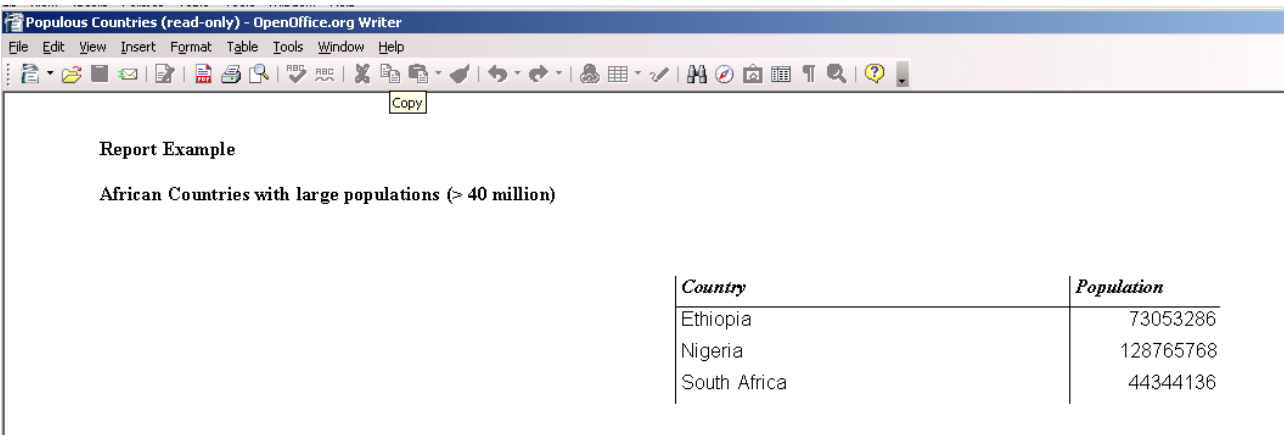
Record 1 of 3

Query view

5.1 OpenOffice.org Base: Using the Application



Form view



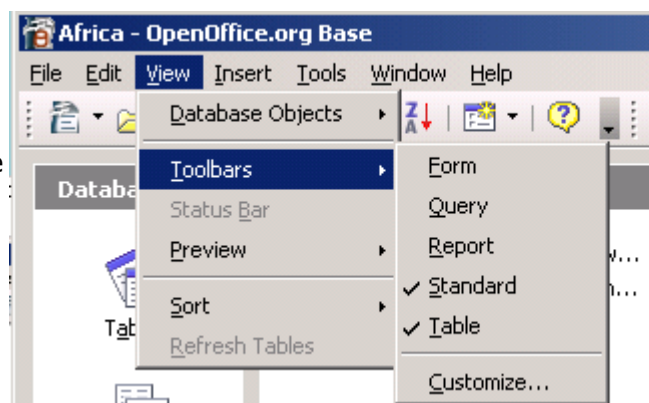
Report view

5.1.3.2 Display, hide built-in toolbars.

- **View » Toolbars**

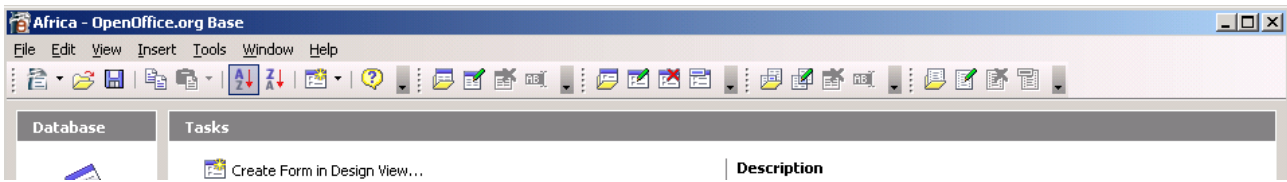
The sub-menu that is displayed shows the available toolbars. Those that are displayed are ticked in the menu.

Each of the options is a toggle. Selecting a displayed toolbar causes it to be hidden, while selecting a hidden toolbar causes it to be displayed.

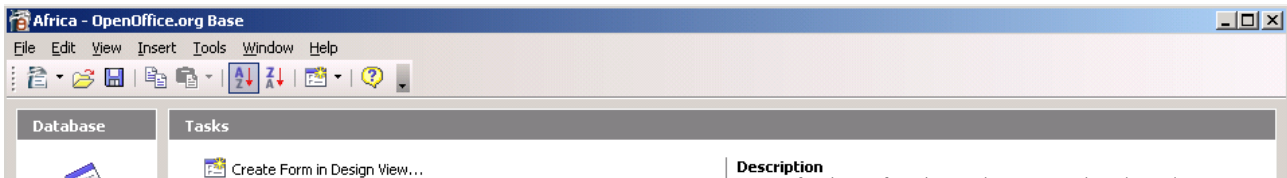


As the toolbars are quite small, they are displayed next to each other rather than below each other. The following screen shows all the toolbars displayed.

5.1 OpenOffice.org Base: Using the Application



If only the standard toolbar was displayed, the toolbar would appear as follows:

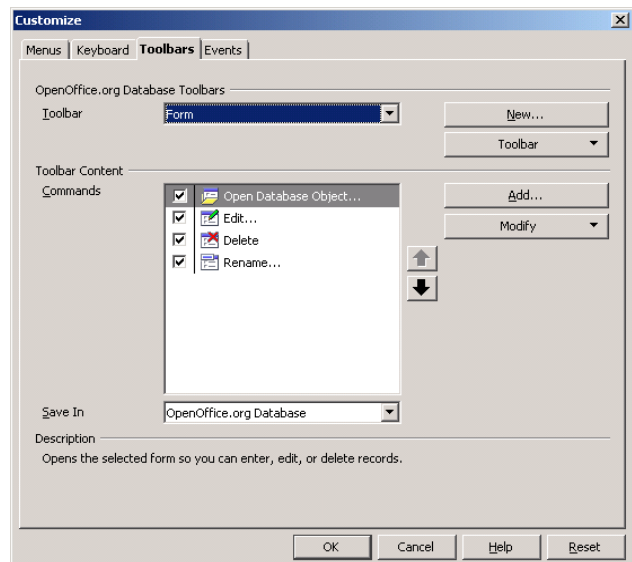


If you wish, you can create a customised toolbar.

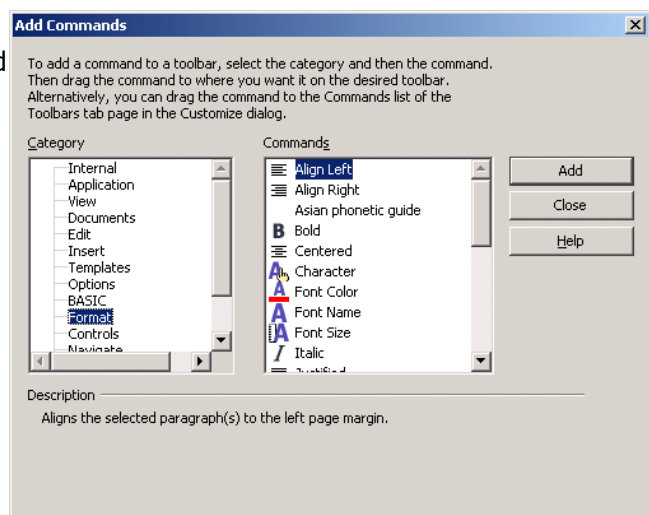
- **Toolbars » Customize.**

This displays the **Customize** dialogue.

You may modify an existing toolbar or add commands to it.



- Click **Add**.
- Select a **Category** containing the command you wish to add.
- Select the **Command**.
- Click **Add**.
- Repeat for other commands.
- Click **Close** when done.
- This process may be repeated for other categories.



Module 5: OpenOffice.org Base

Section 2: Tables

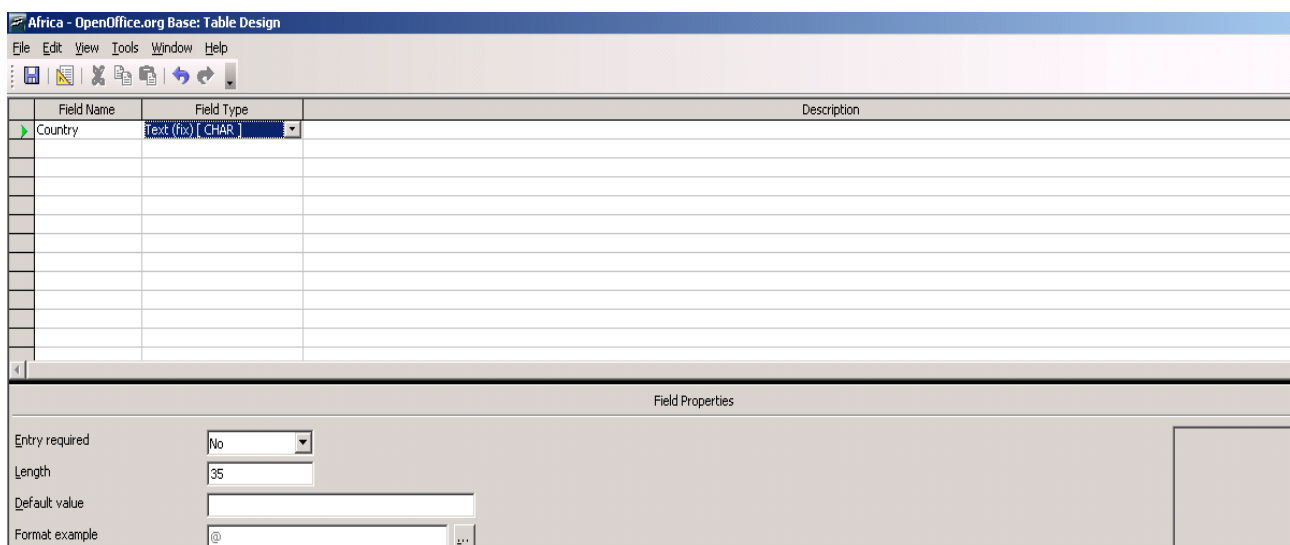
5.2 Tables

5.2.1 Main Operations

5.2.1.1 Create and save a table and specify fields with their data types.

- Open **Base** as previously described.
- If you have already created the **Africa** database, open it. Otherwise, create a database called **Africa** and save it in an appropriate directory.
- Click **Tables** in the **Database** pane.
- Click **Create Table in Design View** in the **Tasks** pane.
- In the **Field Name** column, type **Country**.
- In the **Field Type** column, leave the default field type as **Text (FIX) [char]**.
- Right click at the start of the row and select **Primary key** from the context menu.
- In the **Field Properties** area, change the **Length** from 50 to 35.

The reason for this change is that Base sets aside a certain amount of memory for each field. This is known as the field length. If it is longer than is required, memory is wasted. If it is too short, then not all the data will be able to be entered. Make sure the field length is long enough to handle the largest field, but not unnecessarily long.



- Go to the second row and enter **Population** as the field name.
- Click on the drop down arrow in the **Field Type** column.

The drop down window will indicate a large number of different data types. This is to accommodate the range of data that have been adopted in the various SQL standards over the years. To understand these fully would require going into very technical issues. The following description simplifies the types to the needs of these notes.

Until you study Base at an advanced level, you will be fine using only the following field types.

Numeric: Both refer to numbers that can be positive or negative (ie are signed) and can have a fractional (decimal) part. Technically, float contains a number that is only approximate while decimal is exact. Only use numeric fields if there is the possibility that you will perform arithmetic on their contents.

Integer: If a numeric field will only contain whole numbers (integers), then it is more efficient to use an integer type field. Numbers with fractions or decimal parts cannot be stored in an integer field.

Text: Use this for fields that contain small amounts of text. Technically, the limit is 255 characters. Use text for fields containing numbers if you do not intend to do arithmetic on the numbers.

We will always use the form **Text (Fix) [CHAR]**.

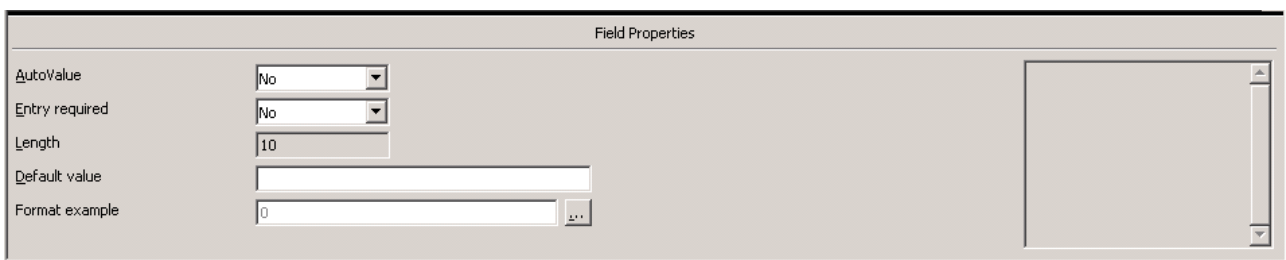
Memo: Use memo fields if you wish to store large amounts of text. Technically, you must use a memo field if a field is to contain more than 255 characters. Base works differently with memo fields and text fields. In the case of text fields, Base sets aside a fixed amount of space but in the case of memo fields, the data is kept in a storage area outside of the table.

Date: Use date to store date fields. A certain amount of arithmetic may be performed on date fields. For example, you can add or subtract a number (days) to a date to get another date. If you subtract one date from another, you get the number of days between. Date fields store day, month and year.

Time: This type of field can store time in the form of hours, minutes and seconds.


Boolean: Boolean can store a value which has only two possibilities such as 1/0, True/False, Yes/No

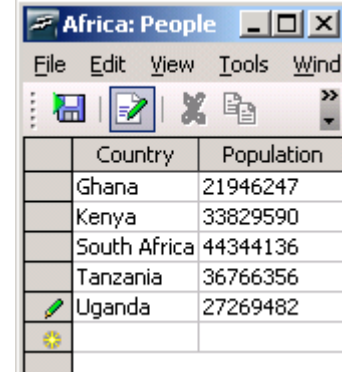
- Create a second field called **Population** with field type **Integer**.
- Notice the **Field Properties**.



- If you wish to force a value to be inserted when the record is created, change the **Entry required** property from **No** to **Yes**.
- You can also automatically insert a value when the record is created by entering the default value for the field in the **Default value** property. We will not do so in this case as it would not serve any useful purpose.
- **File » Close.**
- Call the table **People** and click **OK**.
- **File » Close.**

5.2.1.2 Add, delete records in a table.

- Click on **Tables** in the **Database** pane.
- Double click on **People** in the **Tasks** pane. This will open the table for data entry.
- Click on the left hand cell and type in the country name **Algeria**.
- Press **Enter** or **Tab**. The cursor will jump to the right hand cell.
- Enter the value **32531853**.
- Press **Enter** or **Tab**. This will create a new record.
- Continue in this way until all the data shown on the adjacent screen has been entered.
- Click the **Close** icon, 
- To delete an entire record in a table, select the grey bar to the left of the record and press **Delete**, you will be prompted to ask if you are sure, choose **Yes**.



	Country	Population
	Ghana	21946247
	Kenya	33829590
	South Africa	44344136
	Tanzania	36766356
	Uganda	27269482

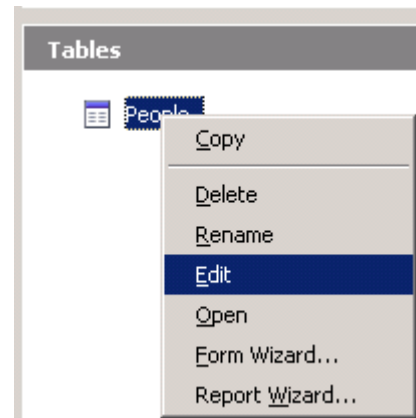
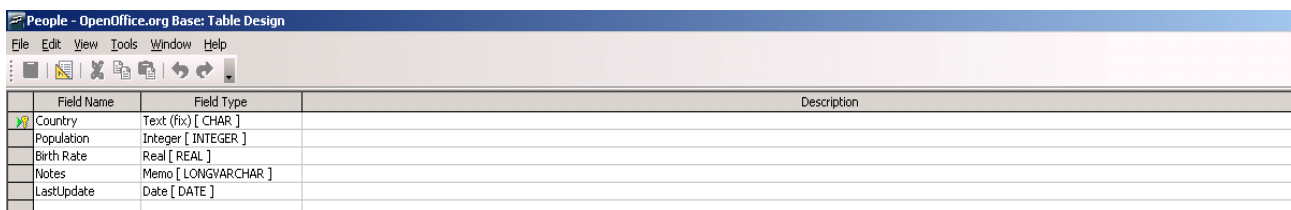
Note that **File** » **Close** will not only close the table but will also close Base.

5.2.1.3 Add a field to an existing table.


- Open the **Africa** database if it is not already open, and click on **Tables** in the **Database** pane.
- Click **Edit** in the contextual menu.

The **Table** will be displayed in a form allowing it to be edited.

- Add three more fields as shown in the following screen.

Field Name	Field Type	Description
Country	Text (fix) [CHAR]	
Population	Integer [INTEGER]	
Birth Rate	Real [REAL]	
Notes	Memo [LONGVARCHAR]	
LastUpdate	Date [DATE]	

- Click the **Close** icon, 
- Answer **Yes** when asked if you wish to save the changes.

5.2.1.4 Add, modify data in a record.

- Double click on the table **People**.

This will displayed the contents ready for editing. Notice that the **Birth Rate** and **Notes** columns are empty.

The previous section illustrated the process of adding records. If you wish to change data in any record, click on the cell containing the data and edit in the same way you would edit any text.

- Enter the data into the blank cells as shown on the adjacent screen.
- Click on the left hand cell of the blank row at the bottom. Enter the additional data as shown on the adjacent screen.

	Country	Population	Birth Rate	Notes
	Ghana	21946247	31.12	
	Kenya	33829590	40.13	
	South Africa	44344136	18.48	
	Tanzania	36766356	38.16	
	Uganda	27269482	47.39	
+				

	Angola	11827315	45.63	
	Namibia	2030692	25.16	
+				

5.2.1.5 Delete data in a record.

Delete data

- Highlight the data or text you wish to delete.
- Press **Del**.

Delete a Record

- Select the grey bar to the left of each record you wish to delete.
- Press the **Del** key.
- Confirm that you wish to delete the selected records.

5.2.1.6 Use the undo command.

- If you make a mistake, **Edit » Undo** or press **Ctrl+Z** immediately after you have made a mistake. This will restore the database to the state immediately preceding the operation. Effectively, **Ctrl+Z** cancels the last operation.

Be careful, **Undo** does not always work. For example, once you have confirmed that you wish to delete one or more records, **Undo** will not be able to recover them.

5.2.1.7 Navigate within a table to next record, previous record, first record, last record, specific record.

The **Navigation bar** is located at the bottom of the table.



This indicates the number of the current record as well as the number of records in the table.

If you know the number of the record you wish to go to, type in the number and press **Enter**.

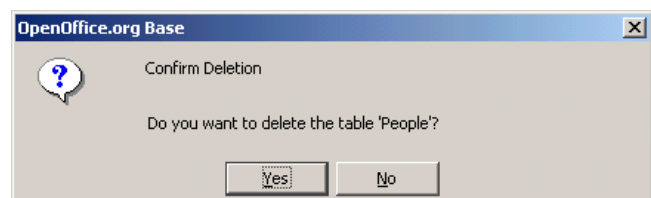
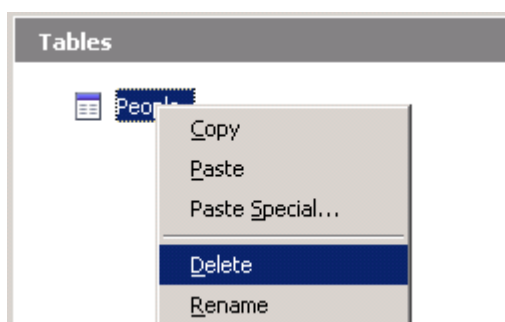
When you move to a record in the table, the first field in that record will be selected (highlighted).

To the right of the number of records are four motion icons. Clicking these will move you to the first, previous, next and last record respectively.

Clicking on the last item will create a new record. The cursor will be positioned in the first field of the new record. You may then enter the data for the record.

5.2.1.8 Delete a table.

- Display the list of available tables by clicking on **Tables** in the **Database** pane.
- Right click on the table you wish to delete and select **Delete** in the contextual menu or press **Del**.
- A dialogue will display the name of the table you wish to delete and ask you to confirm.

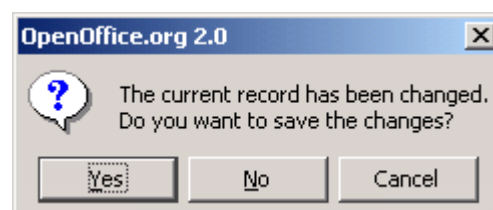


- If you are sure you want to delete the table, click **Yes**. Otherwise, click **No** to cancel.

Note that **Undo** will not allow you to recover a record once you have answered yes.

5.2.1.9 Save and close a table.

- Click the **Close** icon on the top left of the table screen.
- Click **Yes** to save changes and close
Click **No** to abandon changes and close
Click **Cancel** to return to the table.



5.2.2 Define Keys

5.2.2.1 Define a primary key.

Recall that the primary key is the unique field which is used to identify each record in a table. It can also be used to link one table to another in a relationship.

Careful thought needs to be giving as to which field will be the primary key for a table. For example, at first glance a **Name** might seem to be a good primary key. This, however, cannot work since many people have the same name and even the same combination of names. If possible, rather use an existing real identifier such as a national identity number. This is a better option than creating an artificial field.


Sometimes it is necessary to create an identifier such as a customer number. This would be necessary when a company has clients that can be both individuals and other companies.

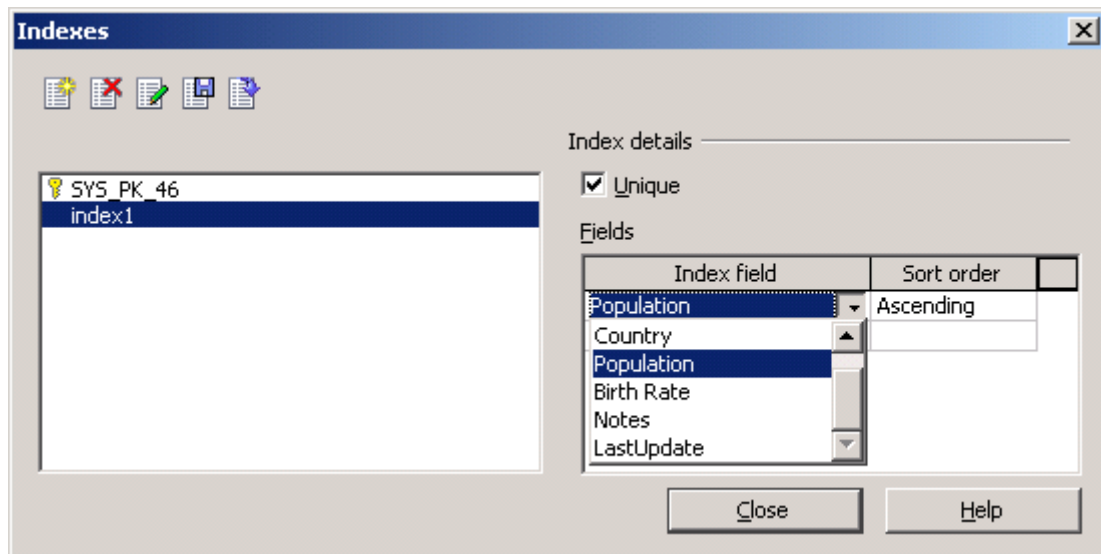
- Right click on the **Table** whose **Primary key** you wish to set or change and select **Edit**.
- Right click on the field that you wish to set as the primary key.
- Click on **Primary key** in the contextual menu.

If a primary key has been set previously, it will be changed to the new field since a table may only have one primary key.

5.2.2.2 Index a field with, without duplicates allowed.

Indexing is a technique that allows records to be sorted rapidly based on fields which have been indexed. In some database systems such as Microsoft Access, fields can be explicitly indexed. A table can be sorted more rapidly on a field that has been indexed than on one which has not. In addition, it is possible to specify that an indexed field must be unique, ie without duplicates. In this way, an indexed field behaves similarly to a primary key.

- Open the **People** table for editing.
- **Tools » Index design**.
- Click on the **New Index** icon, .
- Select **Population** in the **Index field**.
- Check the **Unique** tick box.
If this box is ticked, Base will not allow duplicates in this field - every value will have to be unique.
- In the **Sort order** column, select ascending.



- Create additional index fields, if required.
- Click **Close** when finished.

Since the requirement of no duplicates makes no sense in this case, we remove the restriction as follows:

- **Tools » Index design.**
- Click on **index1**.
- Uncheck the **Unique** tick box.
- Close and save changes.

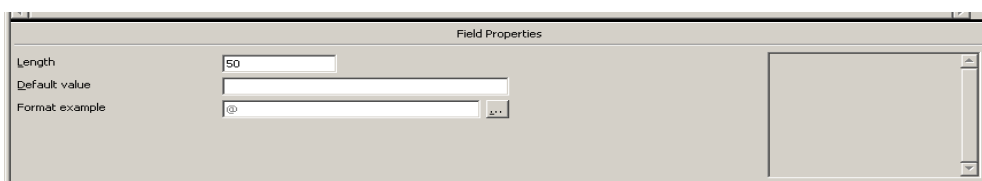
5.2.3 Table Design/Layout

5.2.3.1 Change field format attributes such as: field size, number format, date format.

Field Size

In an earlier section we described the significance of field size. It is sometimes difficult to estimate this in advance. You can change this at a later stage if you wish.

- Open the **People** table for editing.
- Select the **Country** field.
- In the **Field Properties** pane, change the field size from 35 to 30.
- Close and accept the changes.



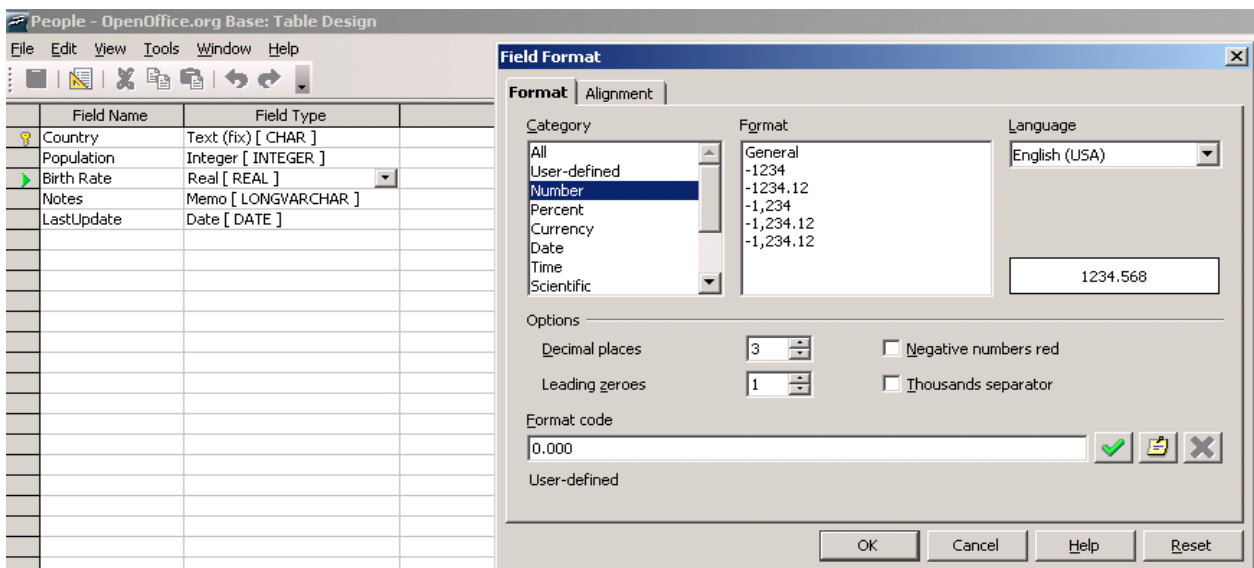
Be careful when you reduce field size. If you shorten a text field, you could lose data. You will not be able to recover this even if you lengthen the field at a later stage.

Number Format

You can change number formatting in two ways. You could change the field type, for example, from **Numeric** to **Integer** or you could change the formatting.

Be careful of changing to **Integer** from **Numeric**. If your data contained any fractional components, these would be lost. Changing back to **Numeric** would not recover the lost fractions.

- Open the **People** table for editing.
- Select the **Birth Rate** field.
- Change the field type from **Real** to **Double**.
Double is able to store numbers to a higher degree of accuracy, but takes considerably more memory and is slower to perform arithmetic on.
- Close and accept changes.
- Open the table for data entry.
The change has had no visible effect on the field as it is an internal process.
- Open the table for editing once again.
- Change the **Birth Rate** field back to **Real**.
- Click **Format example**.
- Change the number of decimal places to 3 as shown on the next screen.

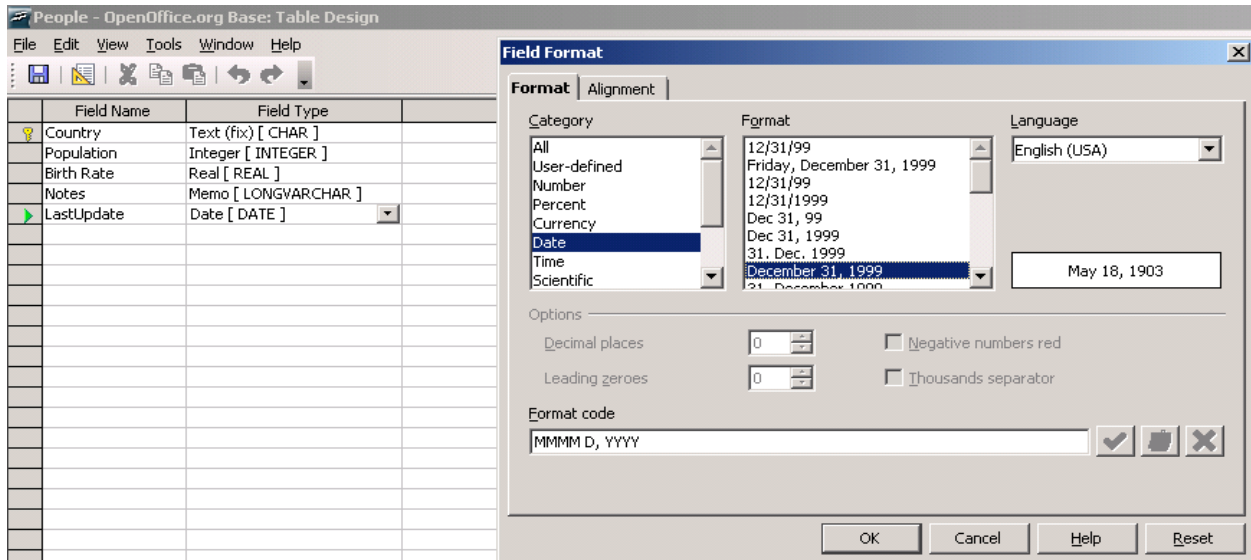


- Click **OK**.
- Close and accept changes.
- Open the table for data entry.
Notice that all the birth rates are expressed to three decimal places. Trailing zeros are added where necessary.

Look at the previous screen. This illustrates the range of formats that numbers can be expressed in. In particular, **Currency** is a very useful format. We can enter currencies as pure numbers and have them formatted correctly in an appropriate currency.

Date Formats

- Open the **People** table for editing.
- Create a new field called **Last Update** and make this of **Date** type.
- Now click on **Format example** in the **Field Properties** window.



- Select a date **Format** and click **OK**.
- Close and accept the changes.
- Now open the table for data entry.
- Enter a date in one of the **Last Update** fields. Use any date entry format you prefer.
- Click on another field.
Notice how the date changes format to the one you specified.
- Close.
- Right click on the table and select **Edit**.
- Select the **Last Update** field.
- Click **Format example** and select a new date format.
- Close and accept changes.
- Open the table for data entry.
Note the format of the date you entered has now changed.

5.2.3.2 Understand consequences of changing field size attributes in a table.

Reducing field size saves memory. For example, the shorter text is, the less memory it uses. Similarly, for number fields, **Integer** uses less memory than **Real** and **Real** in turn uses less memory than **Double**. In general, using a shorter field length also leads to faster database operation.

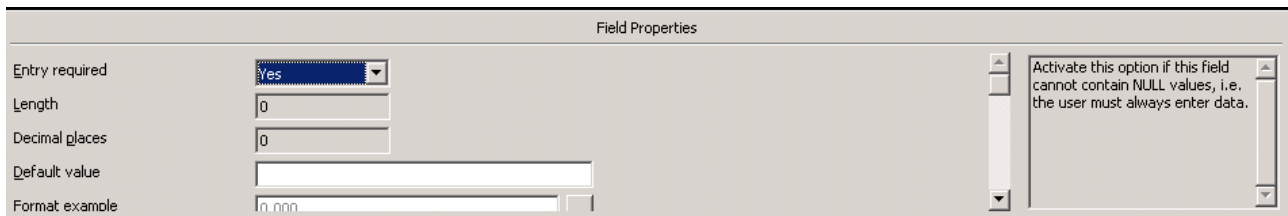
On the negative side, you could lose data if the text length is too small or you could lose the accuracy of your numeric data. For example, converting from **Real** to **Integer** will result in loss of all fractional data. This cannot be recovered by converting back to the original length or type.

For example, suppose a text field is initially 25 characters long and that one record has an entry in this field "Annabella van Kettering". This name contains 23 characters, including spaces. Suppose now you reduce the length of the field to 20 characters, the last three characters will be discarded and the field will contain "Annabella van Ketter". Once the field has been truncated (the last few characters discarded), there is now way of restoring them.

5.2.3.3 Create a simple validation rule for number, text, date/time, currency.

A validation rule is a feature that checks whether data entered into a field meet certain criteria. If the data does not meet these criteria, it is rejected. A simple criteria might be that a number must be positive and between 0 and 100.

At present, in the Base program, the only rule that can be applied, is that the field may not be empty.




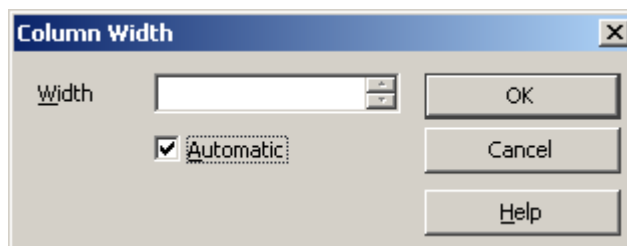
5.2.3.4 Change width of columns in a table.

If the width of a displayed column is too narrow or too wide it can be adjusted using click and drag.

- Open the **People** table for data entry.
- Position the cursor over the dividing line between the headings **Country** and **Population**.

	Country	Population	Birth Rate	Notes	LastUpdate
--	---------	------------	------------	-------	------------

- When the marker  is displayed, hold down the **Ctrl** key, and use the mouse to drag the boundary to the left or right to narrow or expand the **Country** column.
- To change the width to a specific size, select the column that you wish to change, **right click** on them and choose Column Width – specify the width you require.



5.2.3.5 Move a column within a table.

Base does not allow you to change the order of the columns or fields in a table. To see the columns displayed in a different order, you would need to create a query based on the table. This can then have the columns in any order. This topic will be covered in the sections on queries.

5.2.4 Table Relationships

5.2.4.1 Create a one-to-one, one-to-many relationship between tables.

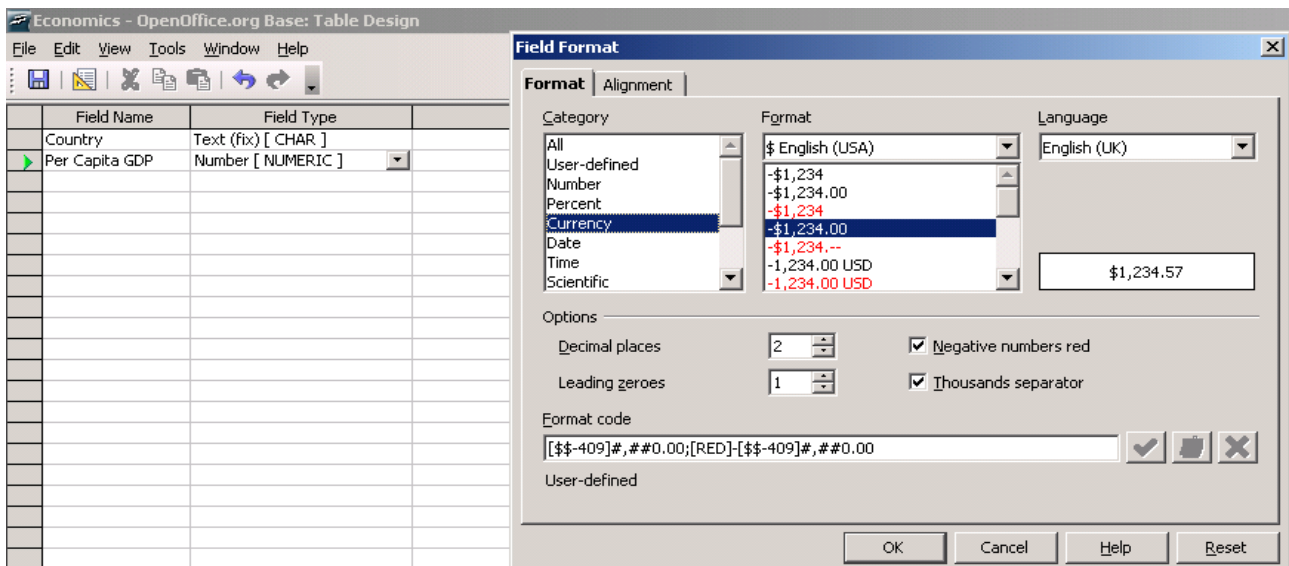
A relationship is a method of connecting the data in two or more different tables. Only one table can be active at a time. We can refer to this as a primary table. The tables to which the primary table is linked are secondary tables.

A relationship has a direction, namely from the primary to the secondary table.

The tables are linked via a common field. A common field is one which contains matching data in the two linked tables. The simplest and clearest method of linking two tables would be via a primary key which is the same in both.

We will illustrate this by means of an example.

- Open the **Africa** database and create a new table called **Economics**. This has two fields: **Country**, a text field of length 35, primary key
Per capita GDP, this is structured as shown on the screen below.



- To achieve this:
Set **Field Type** to **Numeric**
Click **Format Example**.
Select **Currency** in **Category**.
Select the appropriate **Format**.

Click **OK**.

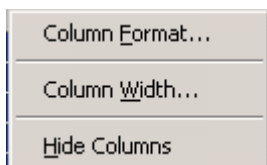
- Close and save changes.
- Give the table the name **Economics**.

A Trick

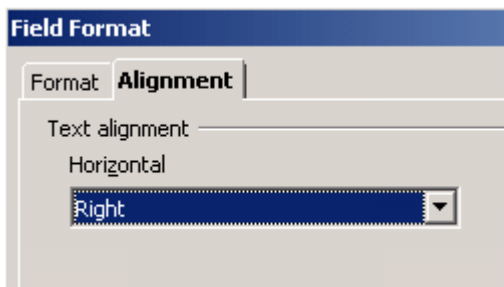
At this point, you would have to type in all the names of the countries. Here is a trick to avoid this.

- Delete the **Economics** table you have just created by highlighting it and pressing **Del**.
 - Highlight the **People** table.
 - **Edit » Copy**
 - **Edit » Paste**
 - When prompted, call the copy **Economics**.
 - Right click on **Economics** and select **Edit**.
 - Delete all the fields except country by clicking on the grey block at the start of the rown and pressing **Del**.
 - Create a new field **Per Capita GDP** as described earlier.
 - Close and save changes.
 - Open **Economics** for data entry.
- You will see all the countries listed. You only need to enter the empty field.
- Enter the **Per Capita GDP** as shown on the following screen.

- Only type the numbers in without any formatting.
Notice that as you click on another block, the number will be formatted to currency.
- Right click on the **Per Capita GDP** title.



- Click **Column Format**.
- Click the **Alignment** tab.



- Select **Right** in the drop down window and click **OK**.
- Click close when complete.

Africa: Economics	
Country	Per Capita GDP
Algeria	\$6,600.00
Angola	\$2,100.00
Burkina Faso	\$1,200.00
Cameroon	\$1,900.00
Cote d'Ivoire	\$1,500.00
Ethiopia	\$800.00
Ghana	\$2,300.00
Guinea	\$2,100.00
Kenya	\$1,100.00
Madagascar	\$800.00
Malawi	\$600.00
Morocco	\$4,200.00
Mozambique	\$1,200.00
Namibia	\$7,300.00
Niger	\$900.00
Nigeria	\$1,000.00
Rwanda	\$1,300.00
Senegal	\$1,700.00
South Africa	\$11,100.00
Sudan	\$1,900.00
Tanzania	\$700.00
Uganda	\$1,500.00
Zambia	\$900.00
Zimbabwe	\$1,900.00

What we now have is two tables with identical **Primary keys**. These will form the link in the relationship between the two tables. Once the relationship is created if, for example, we have **People** open with **Nigeria** the current record, then in the background a pointer will be indicating the **Nigeria** record in the **Economics** table. This will give us access to this data as well.

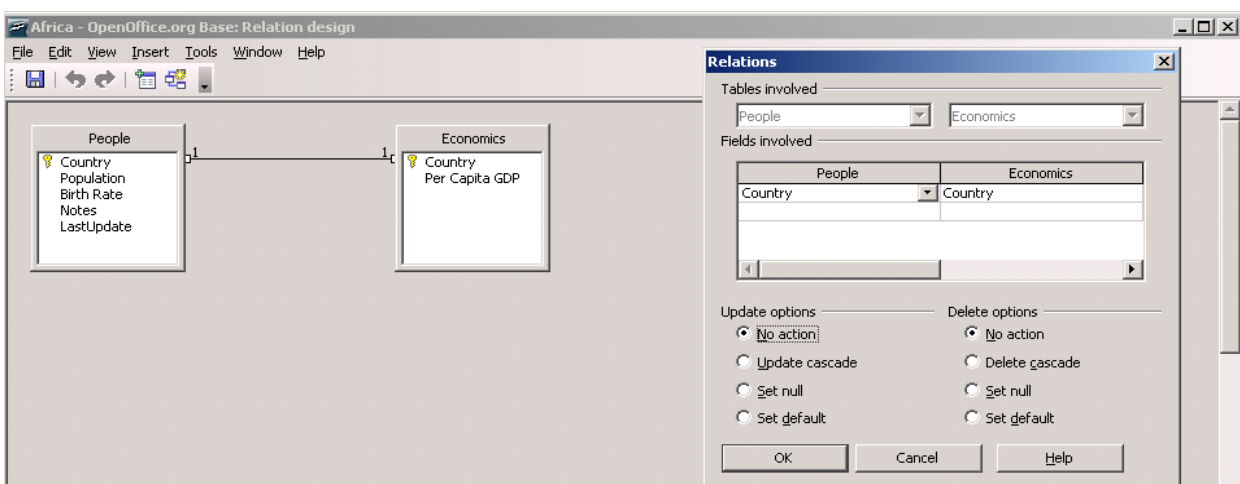
The next step is to create a relationship between the two tables. We will use the term **Parent** and **Child** tables rather than **Primary** and **Secondary**. In this case we would like to make **People** the **Parent** and **Economics** the **Child**.

Notice that each table has a single record for each country. Because of this we say that we are setting up a **One-to-one relationship** between the tables.

We do not need to use the **Primary key** for linking two tables. Other fields could be used. It is possible that these will contain duplicates, ie that the same value may occur more than once in the field. This will mean that at times there may be more than one link from a record in the **Parent** to records in the **Child**. In this case, we say that the relationship is **One-to-many**.

Other possibilities are duplicated fields in both the **Parent** and **Child** or duplicated fields in the **Parent** but not in the **Child**. In these cases the relationship is said to be **Many-to-many** or **Many-to-one** respectively. We will only be concerned with **One-to-one** and **one-to-many**.

- **Tools » Relationships.**
- **Insert » Add Tables.**
- Add the **People** and **Economics** tables.
- Click and hold down the left mouse button on **Country** in the **Economics** table.
- Drag over to **Country** in the **People** table.
This will draw a line between the linked fields in the two tables. This indicates the relationship.
- Right click on the relationship and select **Edit**.

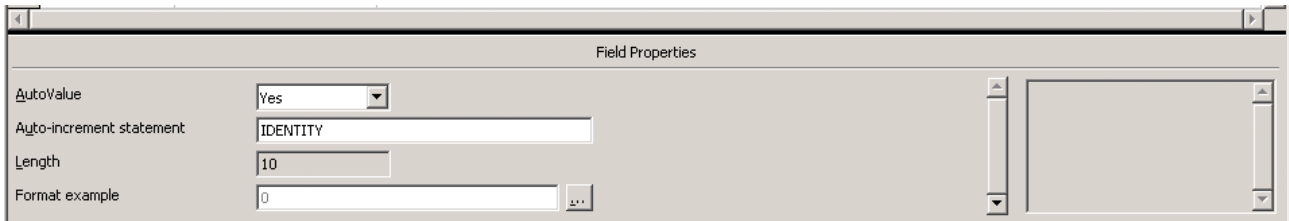


In the **Relations** dialogue, the **Parent** will be shown on the left and the **Child** on the right. If you had clicked and dragged in the opposite direction, the columns would be reversed.

- Click **Cancel**.
- Close and save changes.

To illustrate a **One-to-Many** relationship we will need to create another table.

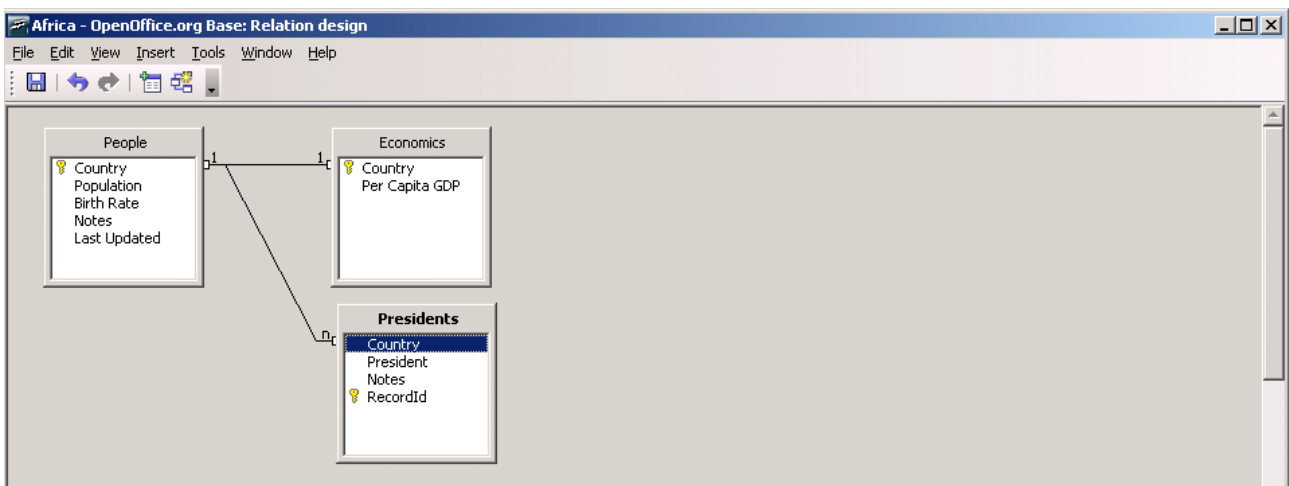
- Create a table called **Presidents** with three fields:
Country: text, size 35, but **NOT** as a **Primary key**.
President: text size 40
Notes: memo
RecordId, Integer, Primary key.
 In the **Field Properties** window, set **AutoValue** to **Yes**.



- Close and save changes.
- When prompted for a **Primary key**, allow Base to create one for you.

In the **Presidents** table, there could be several entries for each country. This means that if we create a relationship between **People** (the **Parent**) and **Presidents** (the **Child**), the relationship will be **One-to-Many**. Conversely, if we had created the relationship between **Presidents** and **People**, it would have been **Many-to-One**.

- **Tools » Relationships.**
- **Insert » Add Tables.**
- Add the **Presidents** table.
- Drag the tables so that they are spaced in such a way as to see the relationships clearly.
- Click on **Country** in **Presidents**.
- Click and drag onto **Country** in **People**.



Note the **1** next to **People** and the **n** next to **Presidents**. This indicates **One-to-Many**.

- Close and save changes.

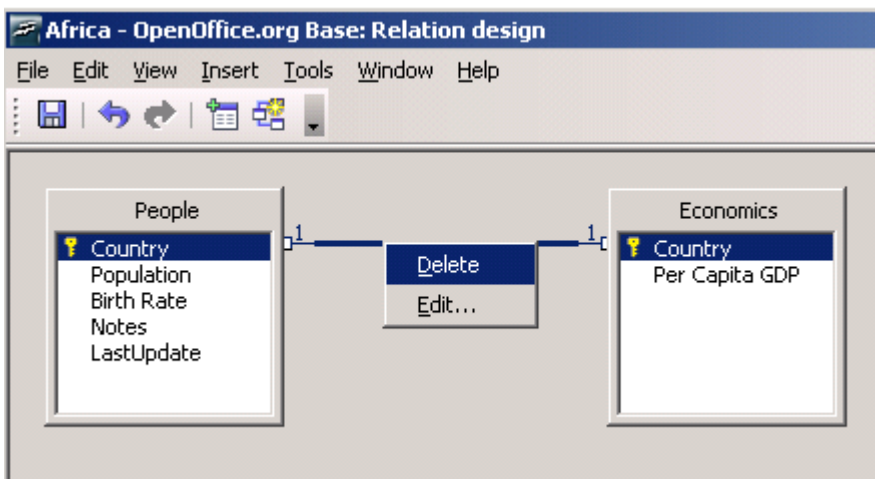
- Open **Presidents** for data entry and enter the adjacent data.
Note that we are deliberately not creating a record for each country.
- Close and save changes.

Country	President	Notes	RecordId
South Africa	Nelson Mandela		0
South Africa	Thabo Mbeki		1
Kenya	Daniel Arap Moi		2
Kenya	Mwai Kibabki		3
South Africa	FW de Klerk		4
Ghana			5

- Close this table. We will use it again in the final section of this chapter.

5.2.4.2 Delete relationships between tables.

- **Tools » Relationships.**
- Right click on the relationship you wish to delete.



- Click **Delete**.
- Close and save changes.

5.2.4.3 Apply rule(s) to relationships such that fields that join tables are not deleted as long as links to another table exist.

Before we go any further we will need to clarify some terms.

A **query** can be viewed as a table that is constructed from some or all of the data contained in other tables. It may comprise only some of the fields and its records may satisfy additional constraints.

When we create a **relationship** between two tables, the link is also called a **join**. A **join** can be of different types.

Inner Join: With the internal join, the results table contains only the records for which the content of the linked fields is the same.

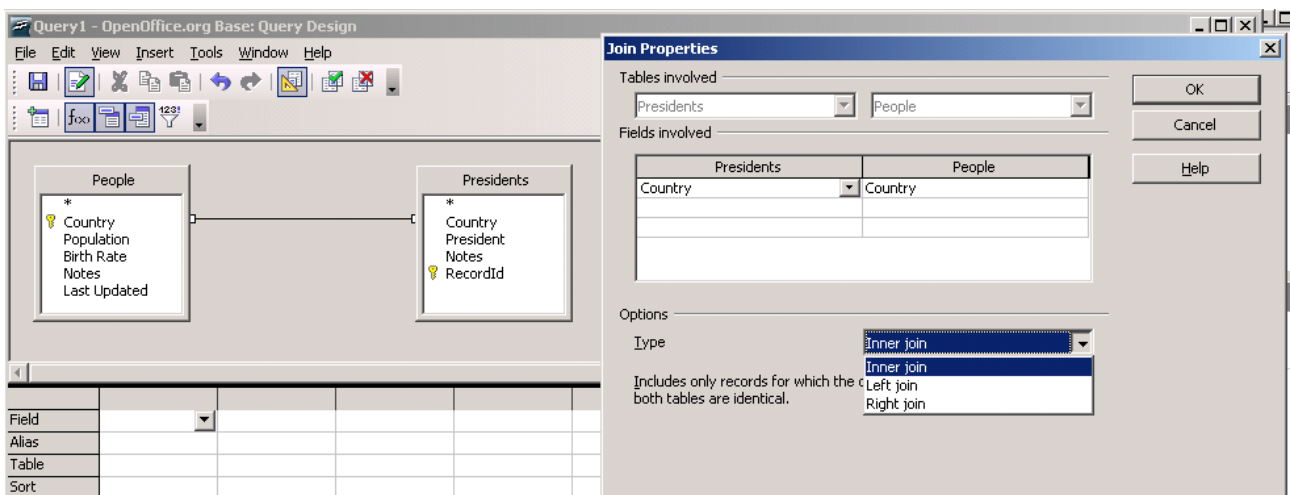
Left Join: With the left join, the results table contains all fields of the left table and only those fields of the right table for which the content of the linked fields is the same.

Right Join: With the right join, the results table contains all fields of the right table and only those fields of the left table for which the content of the linked fields is the same.

Full Join: For a full join, the results table contains all fields of the left and right tables. This option is available in SQL and will not be covered in this course.

We will need to use **queries** to study **relationships** in more detail.

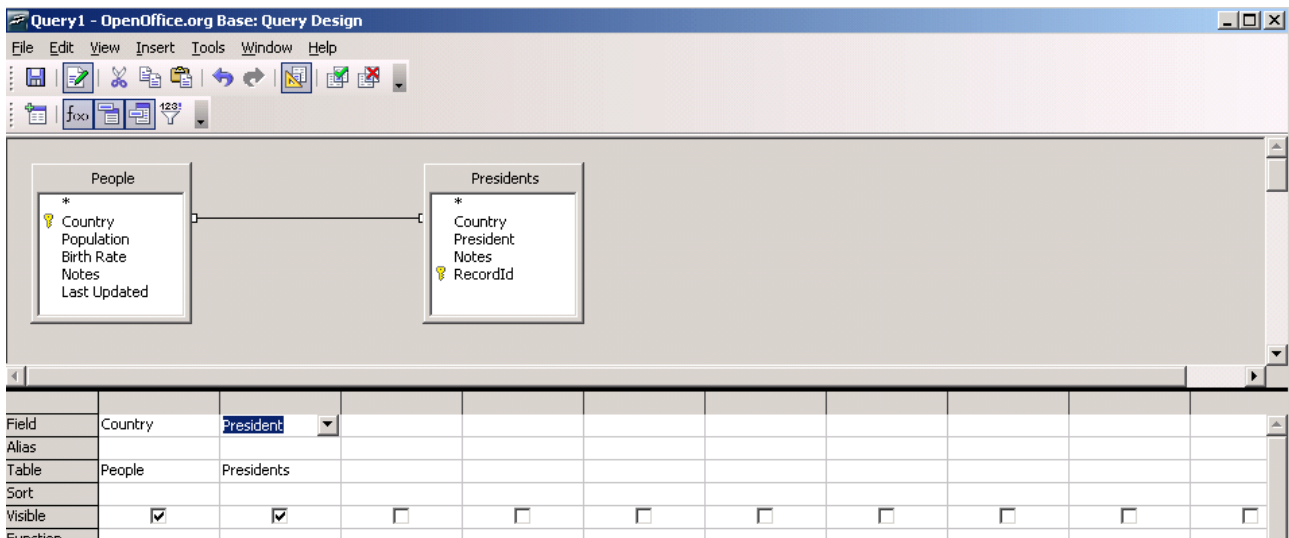
- Click on **Queries** in the **Database pane**.
- Click **Create Query in Design View** in the **Tasks pane**.
- Double click **People** in the **Add Tables** dialogue.
- Add **Presidents** in the same way.
- Drag the **Presidents** table so that the two tables are a distance apart.
- Double click the **join** between the tables.
- Click on the **Type** drop down window.
Your screen should appear as below.



- Select **Left Join** and click **OK**.
- Click on the **Table** cell of the first column and select **People**.
- Click on the **Field** cell of the first column and select **Country**.
The shorthand for this is **People.Country**.
- Click on the **Table** cell of the second column and select **Presidents**.
- Click on the **Field** cell of the second column and select **President**.
The shorthand for this is **Presidents.President**.

Note: Base automatically prevents you from deleting a field that is part of a relationship. If you do attempt to do so, an error message will be displayed.

5.2 OpenOffice.org Base: Tables



- Close and save changes.
- Give the **query** the name **Presidents**.
- Open **Presidents** for editing.

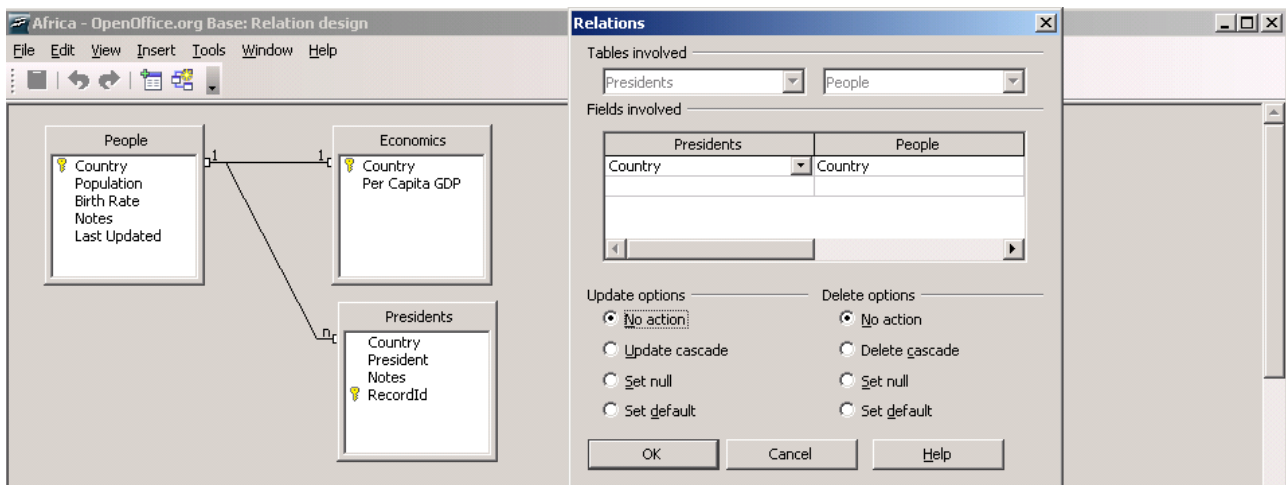
The screenshot shows the 'Africa: Presidents' window. It displays a table with the following data:

Country	President
South Africa	Nelson Mandela
South Africa	Thabo Mbeki
Kenya	Daniel Arap Moi
Kenya	Mwai Kibabki
South Africa	FW de Klerk
Ghana	

As was mentioned earlier, referential integrity refers to maintain a database free of inconsistent data. **Base** automatically looks for violations of referential integrity and will not allow you to insert inconsistent data.

In order to assist in maintaining integrity, Base can impose additional constraints on relations.

- Go to the **Tables** view of the **Africa** database.
- **Tools** » **Relationships**.
- Click on the **join** between **People** and **Presidents**.



The **Relations** dialogue allows you to set options that occur when records are updated or deleted. These are set by checking the corresponding radio button. The following is a summary of the actions taken directly from the OpenOffice.org Help system.

Update options

Here you can select options that take effect when there are changes to a **primary key** field.

No action: Specifies that any change made to a primary key does not affect other external key fields.

Updating cascade: Updates all the external key fields if the value of the corresponding primary key has been modified (Cascading Update).

Set null: If the corresponding primary key has been modified, use this option to set the "IS NULL" value to all external key fields. IS NULL means that the field is empty.

Set default: If the corresponding primary key has been modified, use this option to set a default value to all external key fields. During the creation of the corresponding table, the default value of an external key field will be defined when you assign the field properties.

Delete options

Here you can select options that take effect when a primary key field is deleted.

No action: Specifies that the deletion of a primary key will not have any effect on other external key fields.

Delete cascade: Specifies that all external key fields will be deleted if you delete the corresponding primary key field.

When you delete a primary key field with the **Delete cascade** option, all records from other tables that have this key as their foreign key are also deleted. Use this option with great care; it is possible that a major portion of the database can be deleted.

Set null: If you delete the corresponding primary key, the "IS NULL" value will be assigned to all external key fields.

Set Default: If you delete the corresponding primary key, a set value will be set to all external key fields.

Module 5: OpenOffice.org Base

Section 3: Forms

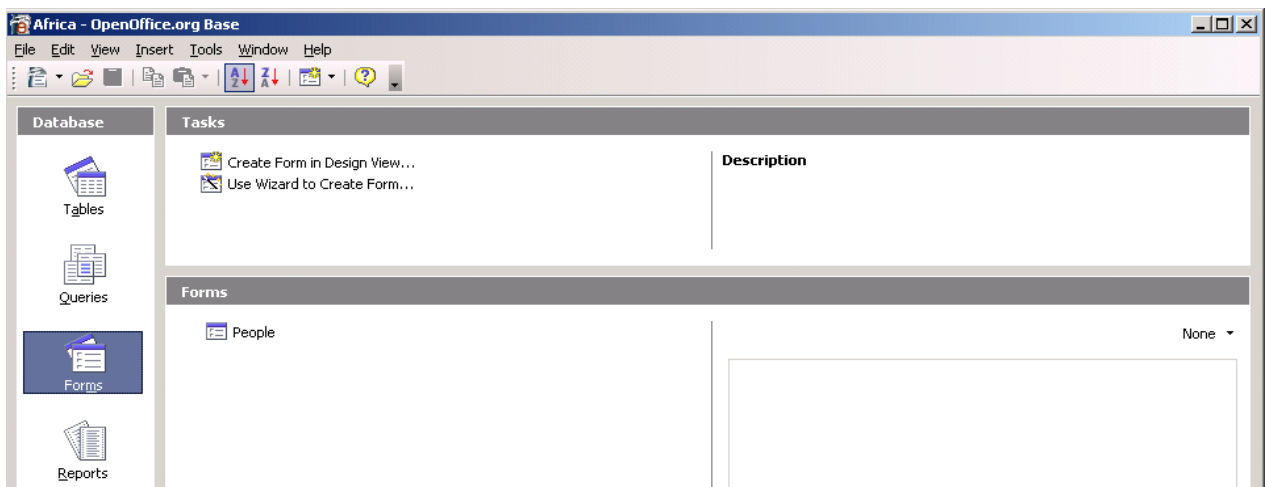
5.3 Forms

5.3.1 Working with Forms

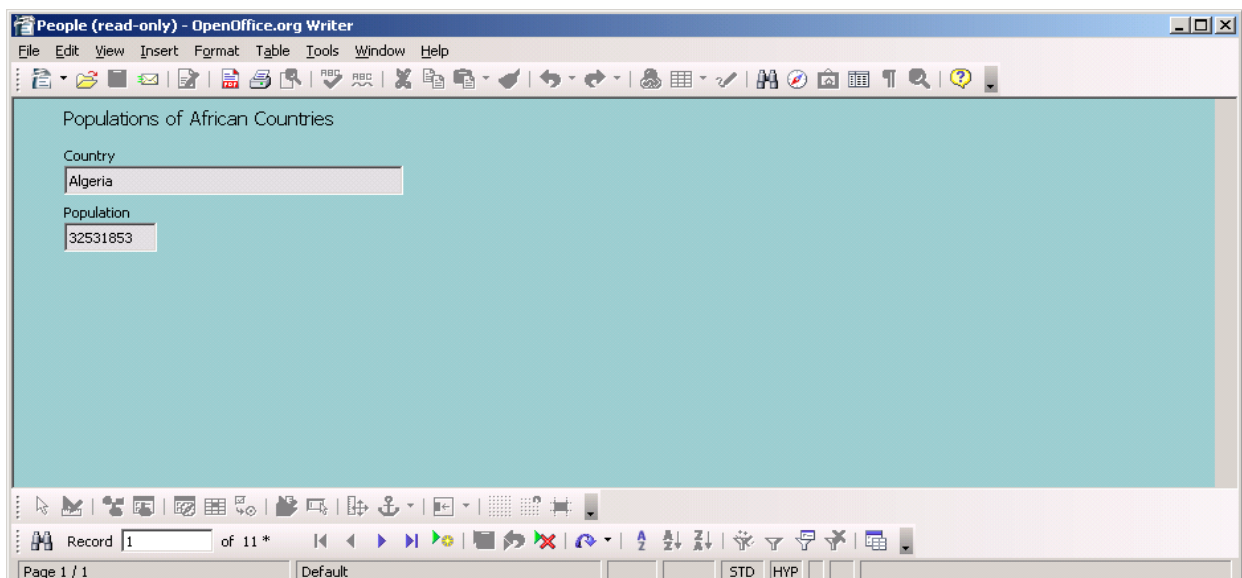
5.3.1.1 Open a form.

A form can be opened by clicking on its icon in **forms view**. The following example assumes that there is a form called **People** in the **Africa** database.

- Open the **Africa** database.
- Click on **Forms** in the **Database** pane.



- Double click on **People** in the **Forms** pane.

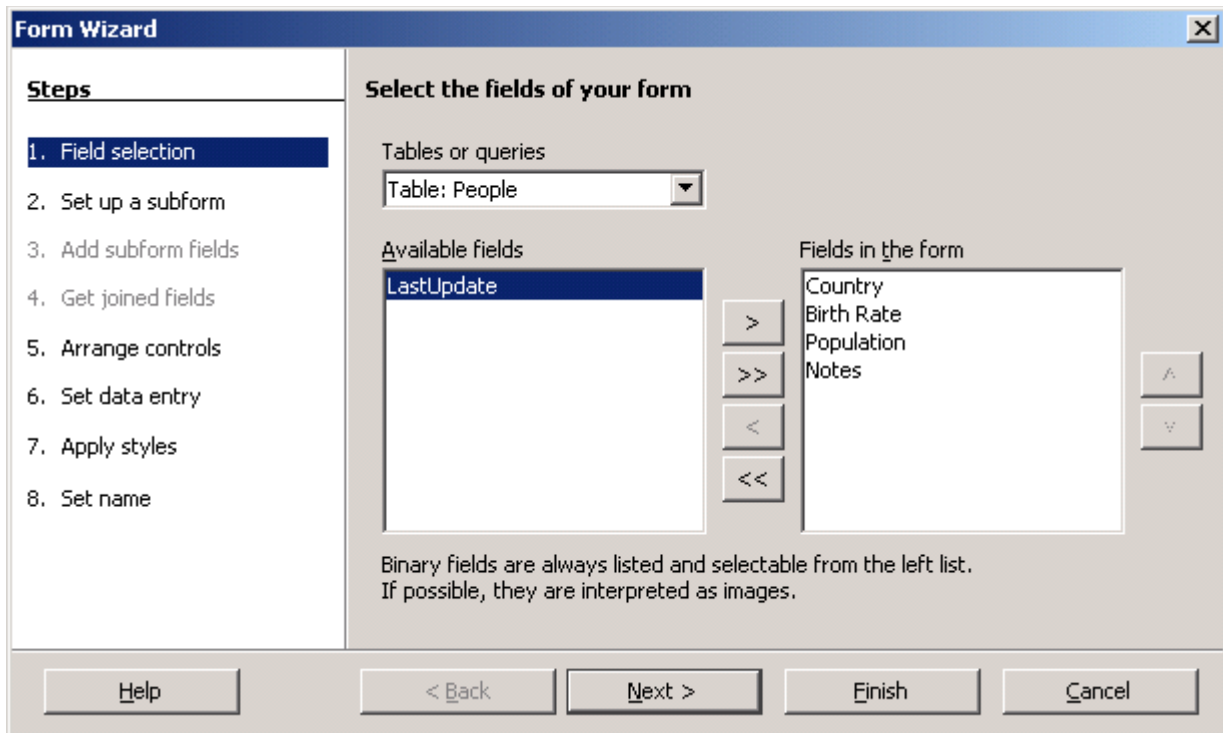


Notice the **scroll bar** at the bottom of the screen. This functions in exactly the same way as the scroll bar when records are displayed.

- Click the **Close** icon when done.

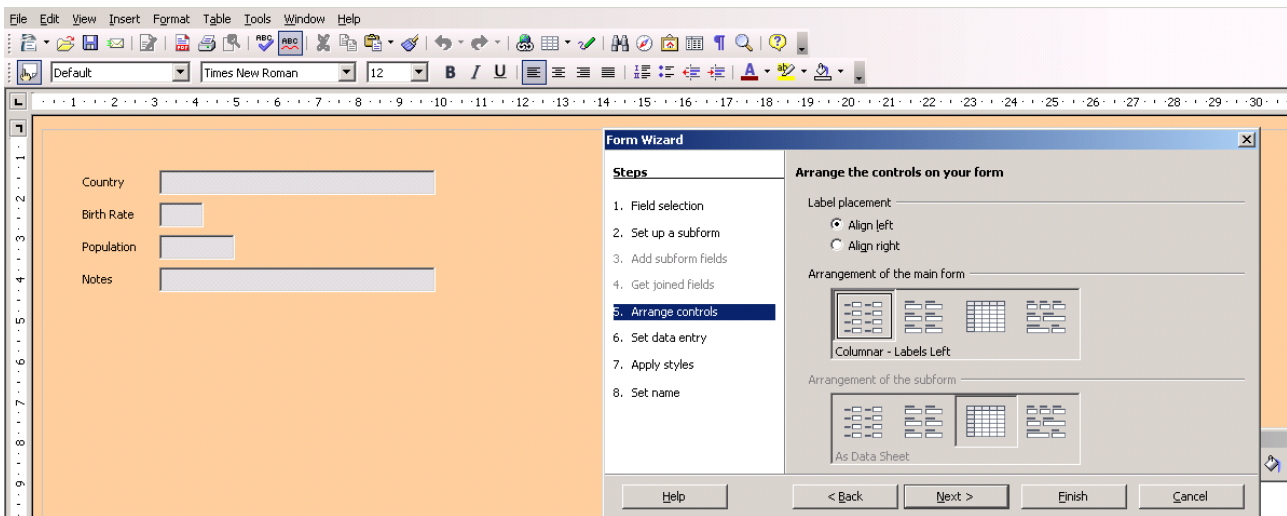
5.3.1.2 Create and save a form.

- Make sure you are in **Forms** view.
- Click **Use a Wizard to Create a Form**.
This will display the **Form Wizard**.
- In the **Tables of Queries** drop down window, select **Table: People**.
- Double click on the fields: **Country, Birth Rate, Population and Notes**.
These are the fields that you would like to appear on the form.

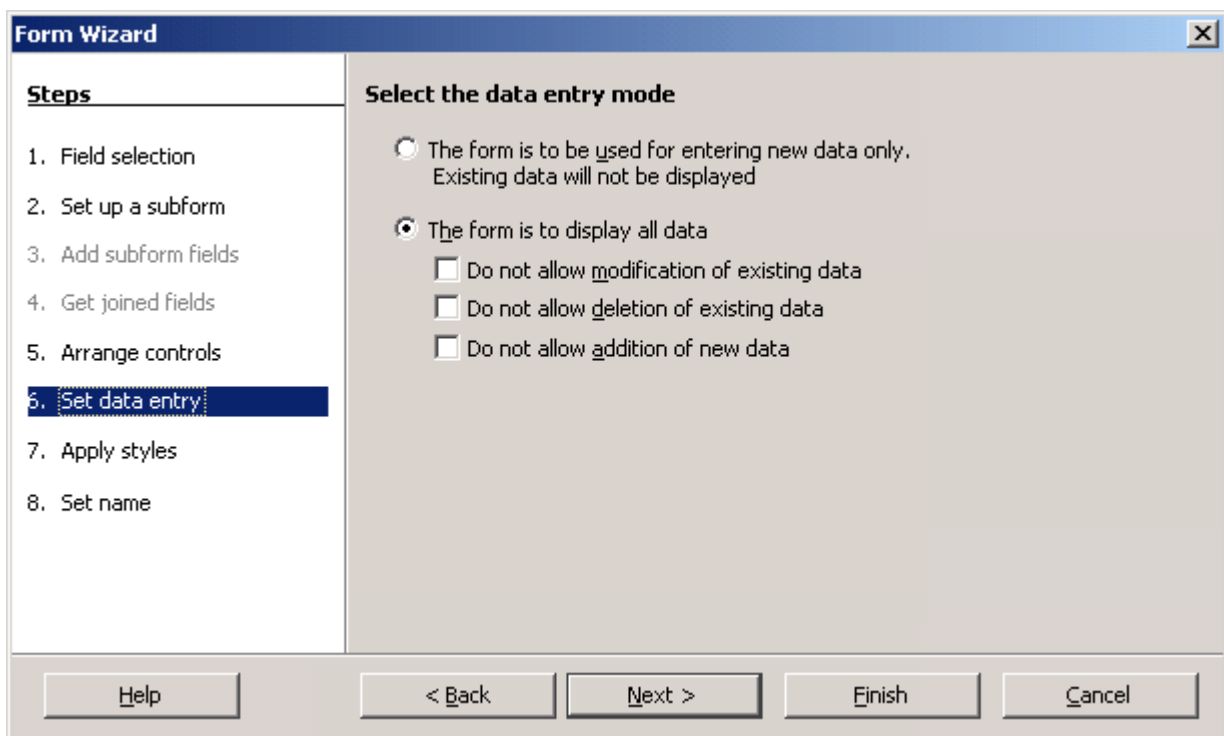


- Click **Next**.
- Click **Next** on the next dialogue.
- Click **Columnar Labels Left**.
This is the first option of the **Arrangements**.
As you select and arrangement, the form will change accordingly.

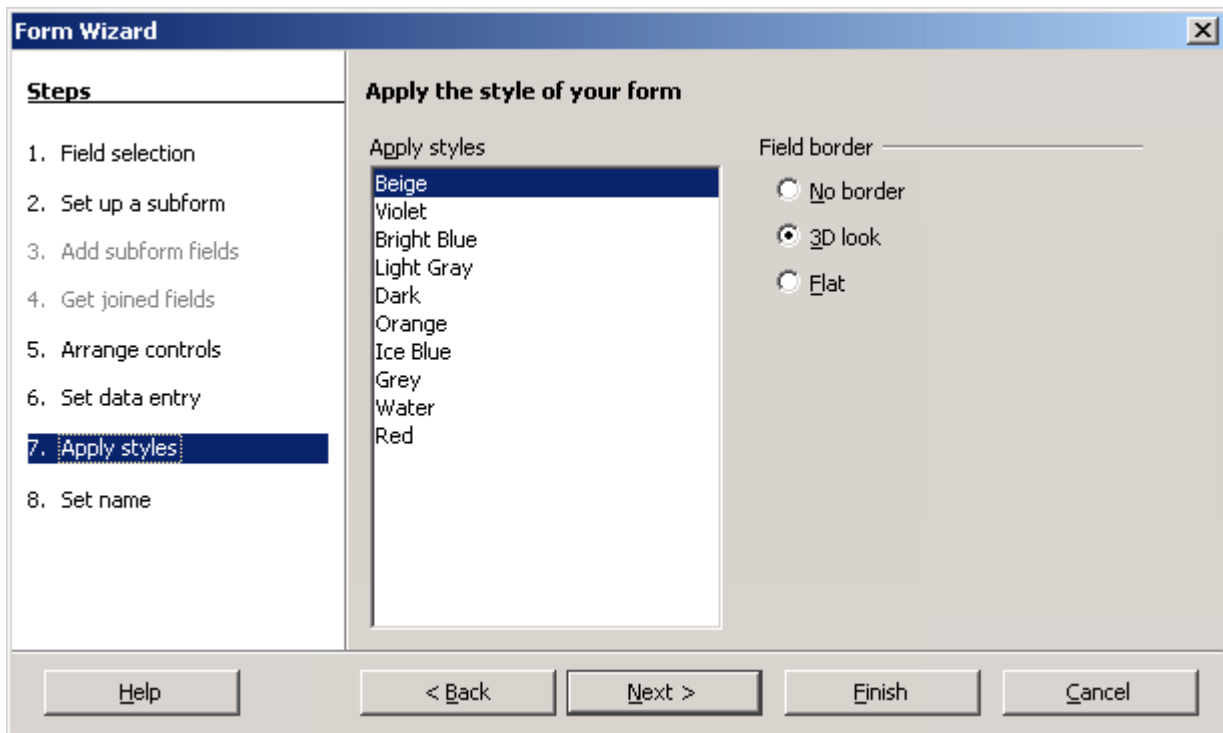
5.3 OpenOffice.org Base: Forms



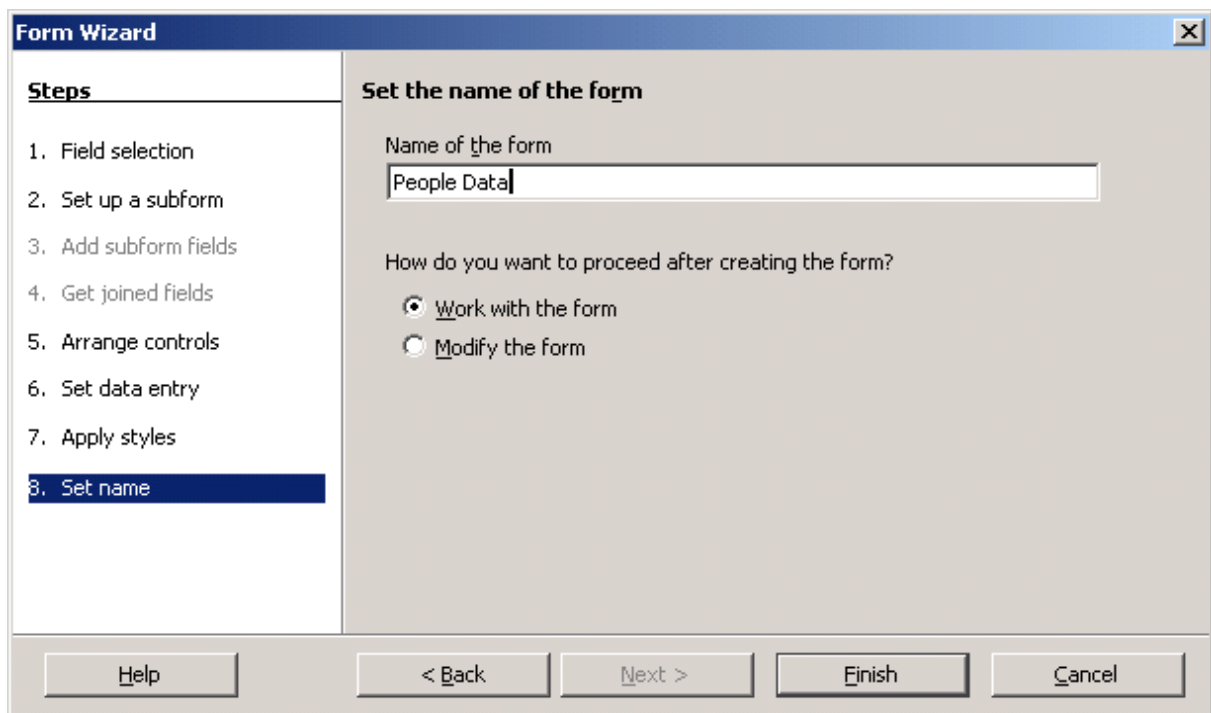
- Click **Next**.
Notice the options available for **data entry mode**.



- Click **Next** as the above settings are what we need.
- If you wish you can change the style of the form.

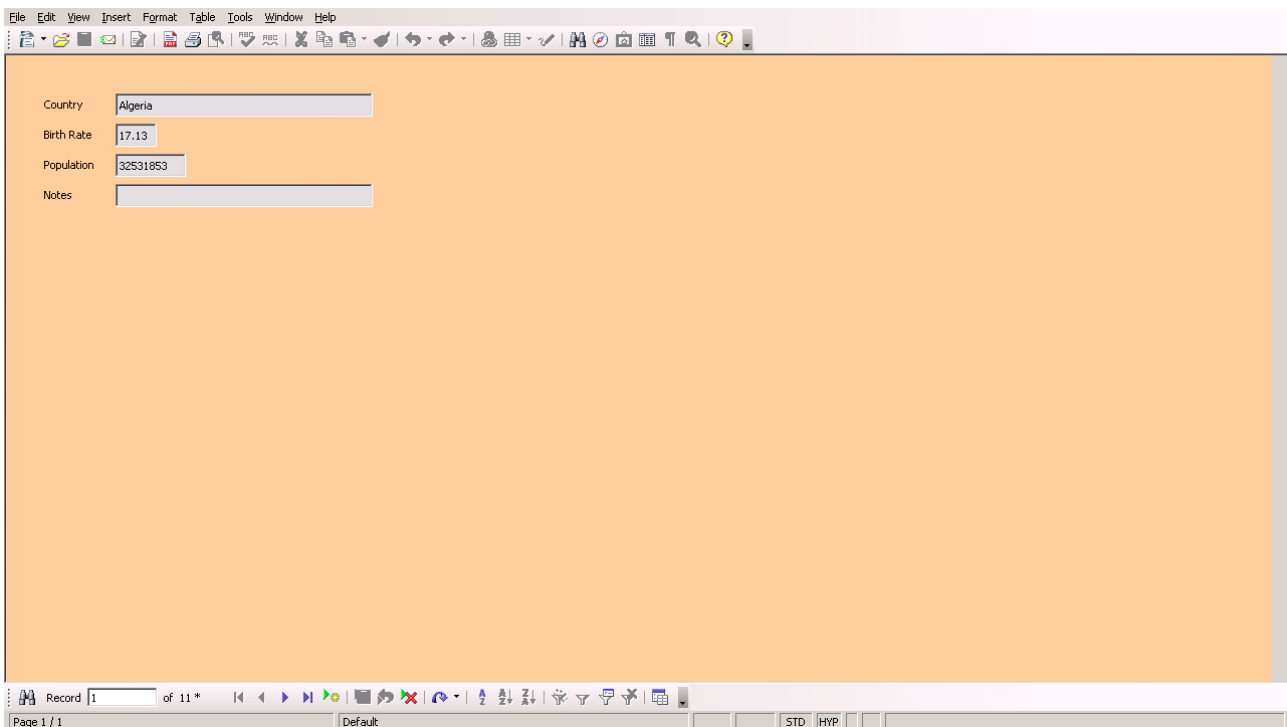


- Apply a different style, if you wish.
- Click **Next**.
- Give the form the name **People Data**. This last option would be to name the form and automatically save the form as such.



- Click **Finish**.

5.3 OpenOffice.org Base: Forms



The form can now be used for viewing, adding, deleting or editing data.

5.3.1.3 Use a form to enter, modify, delete records.

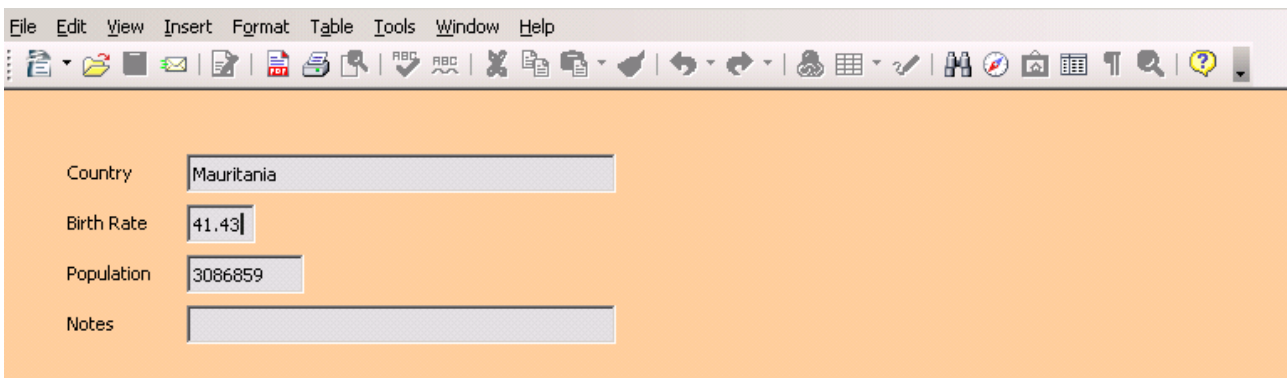
Enter a new record

- Click the **New Record** icon on the scroll bar.



This displays a blank record on the screen.

- Enter the data shown on the following screen.



- Close and save changes or add another record to save the record you have just added.

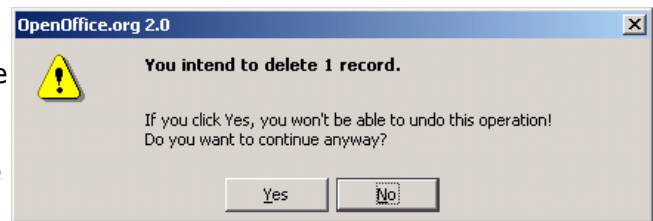
Delete a record

- Click on the **Delete** icon on the **Scroll bar**.



- Click **Yes** to confirm that you wish to delete the record.

Note that once a record is deleted, it cannot be recovered.



Edit a record

- Locate the record you wish to edit.
- Make the changes on the form.
- Either close or go to another record. When you do, the changes will be recorded.

5.3.1.4 Go to next record, previous record, first record, last record, specific record using form display.

The **Scroll bar** at the bottom of the screen provides a number of methods for locating records.

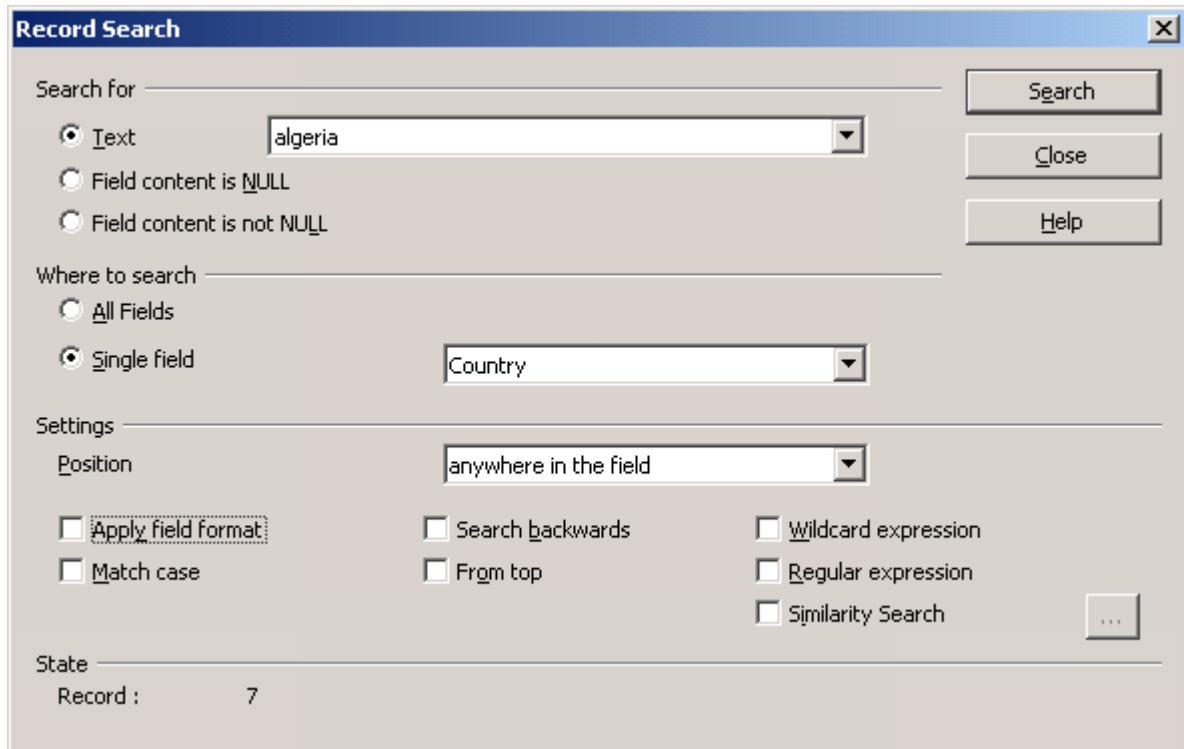


- Enter a record number into the **Record** window and press **Enter**.

The next four icons allow you to scroll through the records. They are respectively:

- Goto first record
- Go to previous record
- Go to next record
- Go to last record.

- Click on the first icon (the binoculars).
- This will display a **Search dialogue** which will enable you to locate a record in terms of its contents.
- For example, to find information on **Algeria** you would change the dialogue as shown on the following screen.
Notice the range of options that can be set when searching. If you tick **Match case**, then the search will not only match the letters but also whether they are upper case. **Algeria** would be treated as a different word to **algeria**.



5.3.1.5 Add, modify text in Headers, Footers in a form.

A header or footer is any data or information that appears identically at the top or bottom of each form.

The items that appear on a form are called **controls**. One example is a **field** and **field label** taken from a table. Controls that contain fixed text are called **labels**. Headers and footers only appear at the top or bottom of a form. Headings can be inserted anywhere. Labels are used to insert headings.

Headings

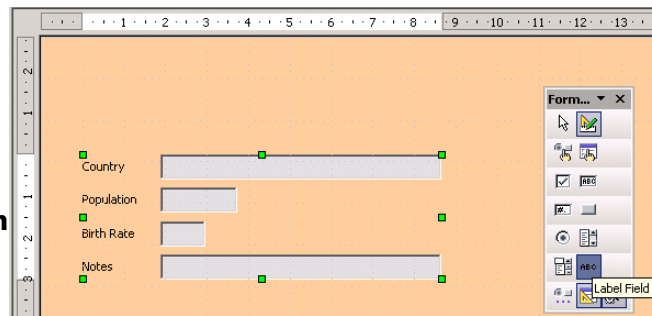
In this example, we will put a label on each form. This will indicate the title of the form.

- Open the **People** form for editing.

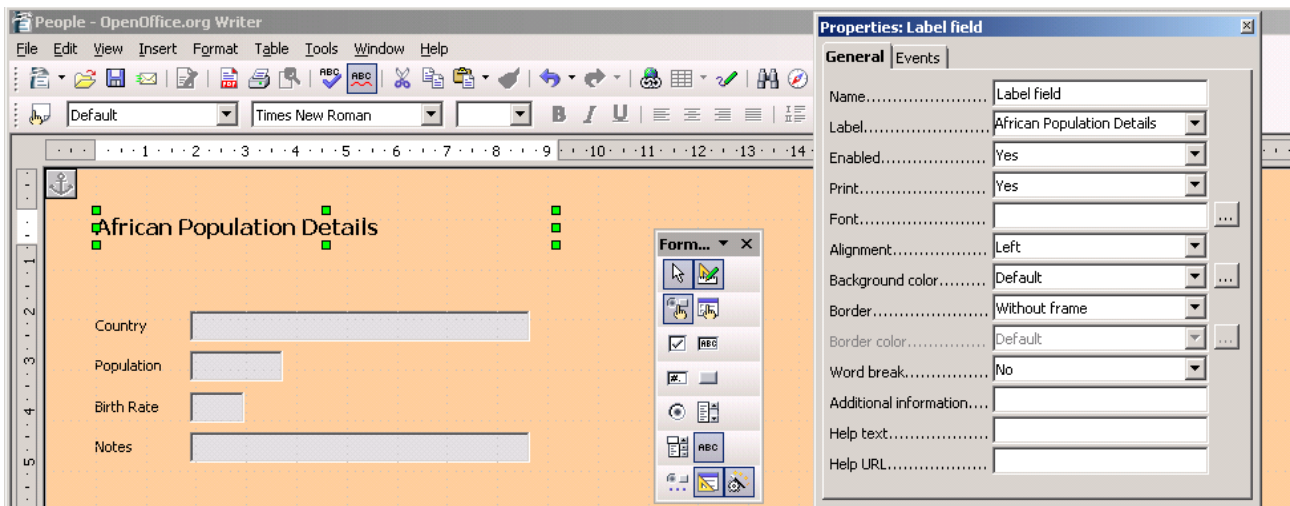
We need to make space for the heading so we will need to move all the fields and labels.

5.3 OpenOffice.org Base: Forms

- Hold down the **Shift** key and click on each of the fields.
- Move the cursor over the selected fields. When it appears as a cross-hair, drag the controls down the form.
- Click on the **Label** control in the **Form** toolbox.



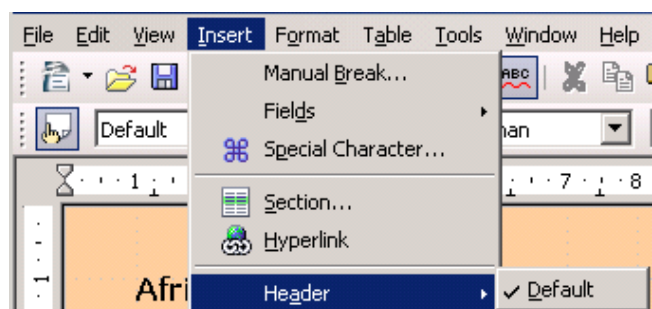
- Drag and mark out an area for the label. This will appear as a rectangular area.
- Right click on the **label** and select **Control**. This will display the label properties dialogue.
- Type **African Population Details** into the **Label** property.
- Set a **font** by clicking on the **Font** property. For example, set the font to **Verdana, 12pt bold**.
- Notice the other properties that you can set.



- Close the **Properties dialogue** when done.
- Close and save changes.
- Open the form in data entry view and scroll through the records. Notice the effect of our heading.

Headers and footers

- Open the form for editing.
- **Insert » Header**.
- If **Default** is checked, press **Esc**, otherwise click **Default**.
- Do the same with **Insert » Footer**.
- **View » Print Layout**.
If **Print Layout** is already checked, press **Esc**.
The header and footer areas will be marked out by horizontal lines.



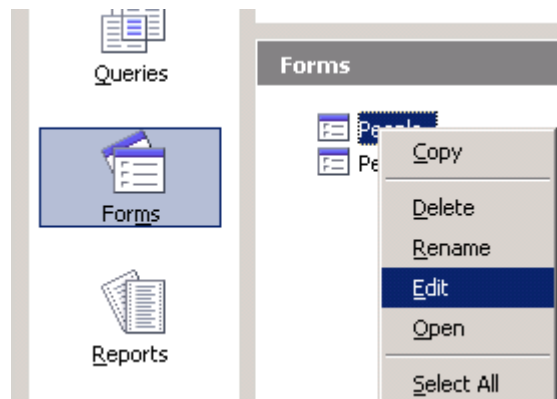
- Scroll down to the bottom of the form.
- Position the cursor in the **footer**.
- Press the **Centre Justify** icon.
- **Insert » Fields » Date**
Notice the other fields that you could have inserted.
- Right click on the **Date**, select **Fields**.
- Select a suitable format for the date and click **OK**.
- Close and save changes.
- Open the form in data entry view and scroll through the records to see the effect.

Edit Header / Footer

You can delete, enter or modify text and fields in the Header / Footer by scrolling down to the footer and treating the entries in the same way as any other text, the same applies with the Header.

5.3.1.6 Delete a form.

- Right click on the form in the **Forms** pane.
- Click **Delete**.
- Confirm that you wish to delete the form.



5.3.1.7 Save and close a form.

- Click the **Close** icon in the top right had corner.
- Click **Accept** or **Discard** depending on what you wish to do with the changes you have made.

Module 5: OpenOffice.org Base

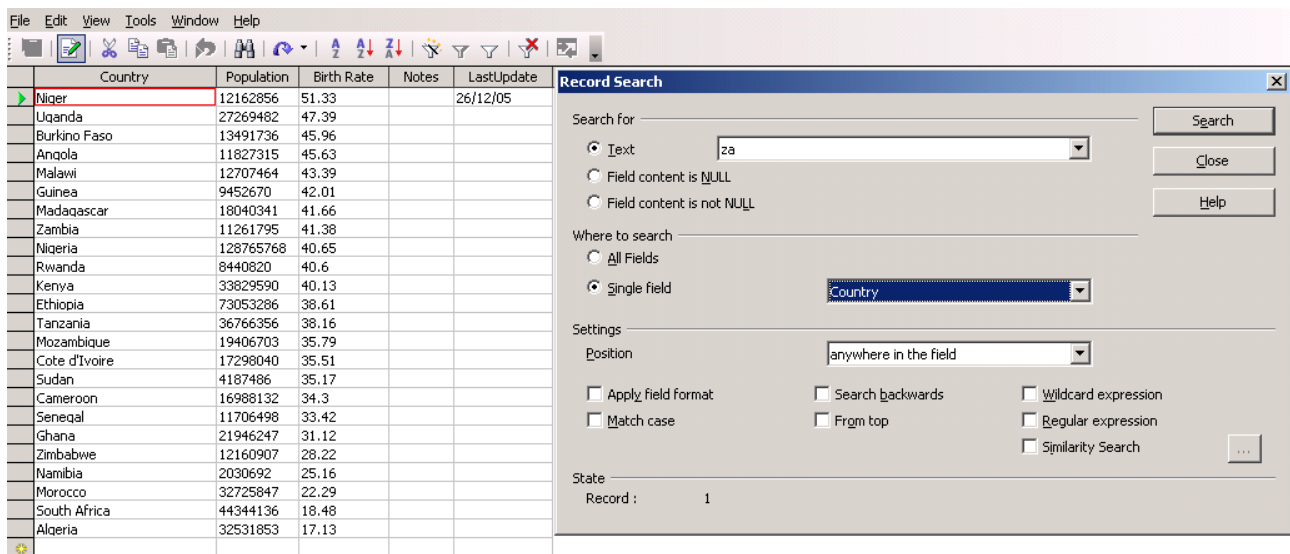
Section 4: Retrieving Information

5.4 Retrieving Information

5.4.1 Main Operations

5.4.1.1 Use the search command for a specific word, number, date in a field.

- Open the **People** table.
- Click the **Find** icon on the **toolbar**.



This displays the **Record Search** dialogue.

The options are as follows:

- Search for:** **Text**
Field content is NULL: This refers to empty fields
Field content is not NULL: This refers to fields which contain something, where the actual contents are not relevant.
- Where to search:** **All fields:** The search will scan all fields.
Single field: The search will only scan a single field in each record. This field is selected from the adjacent drop down window.
- Position:** This option is selected from the drop down window. Options are:
Anywhere in the field
Beginning of the field
End of the field
Entire field: In this case the contents of the field must match the search text exactly.
- Settings:** These specify additional aspects of the search.
Apply field formats: The formatting must match in addition to the text.
Match case: The search must match both the text and their case.

For example, **Zambia** will not be a match for **zambia**.

Search backwards: Normally a search is conducted from the current record forwards. If this option is selected, the search will be conducted in the opposite direction.

From top: The search will be conducted from the start of the database irrespective of the current record.

Wildcard expression: This enables you to use place holders to replace one or more letters. You would use this when you are not sure of the spelling.

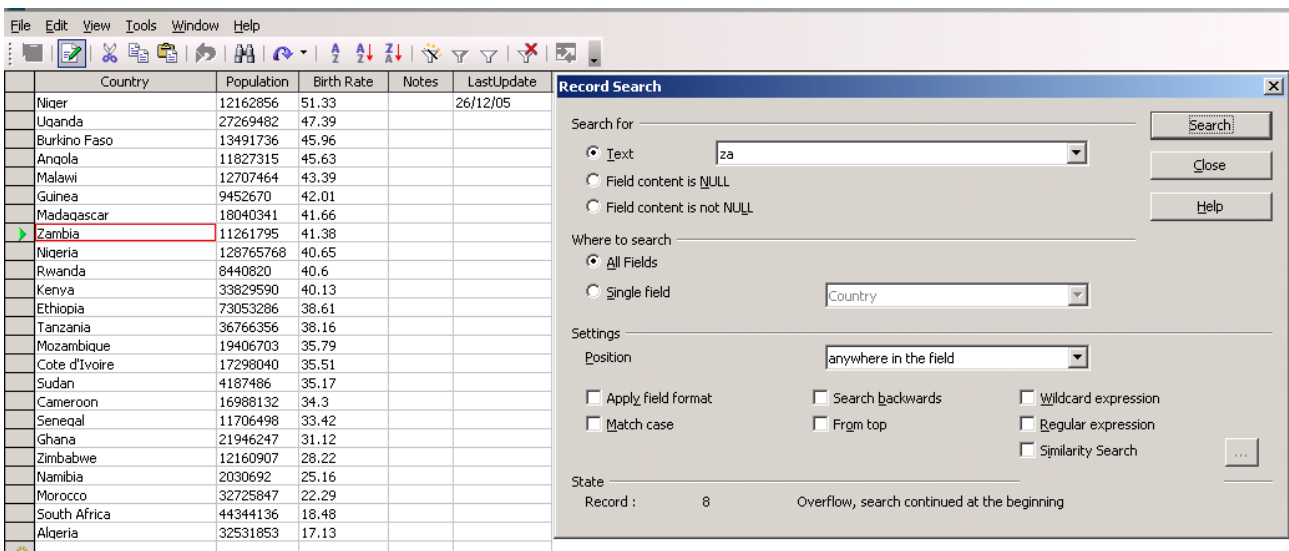
You can use the following wildcards:

?	for exactly one arbitrary character	"?loppy" returns "Floppy" "M?ller" returns, for example, Miller and Moller
*	for 0 or more arbitrary characters	"*-*" returns "ZIP-Drive" and "CD-ROM" "M*er" returns all entries starting with an "M" and ending in "er" (for example, Miller, Moller, Mather)

If you want to search for the actual characters ? or *, preface them with a backslash: "\?" or "*". However, this is only necessary when **Wildcard expression** is enabled. When the option is not enabled, the wildcard characters are processed like normal characters.

The other options do not concern us at this stage.

- Complete the **Record Search** dialogue as shown on the following screen.
- Click **Search**.
This locates the first record satisfying the search.



- Click **Search** repeatedly.
Notice how the search will locate the records one at a time. When it has reached the last record, the search will return to the first. You may edit the records as they are located.

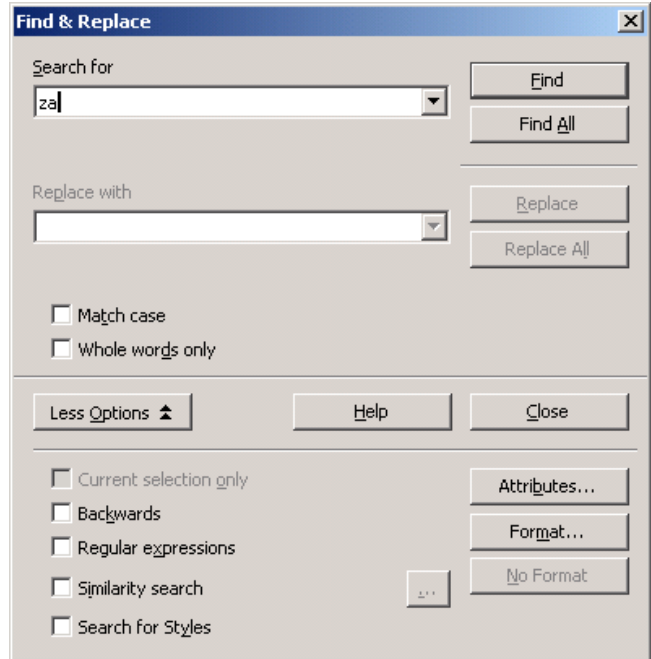
Note: Searching for numbers and dates: If you wish to search for a number or a date you use the same dialogue. In place of the text, enter the number or the date you wish to search for. Remember to select the appropriate field.

Searching forms

Searching forms operates in a similar way to searching tables. The **search dialogue** for forms is displayed on the adjacent screen.

The major difference is that you can now use the search for changing text. This is the same as the **Find & Replace** in **Writer**.

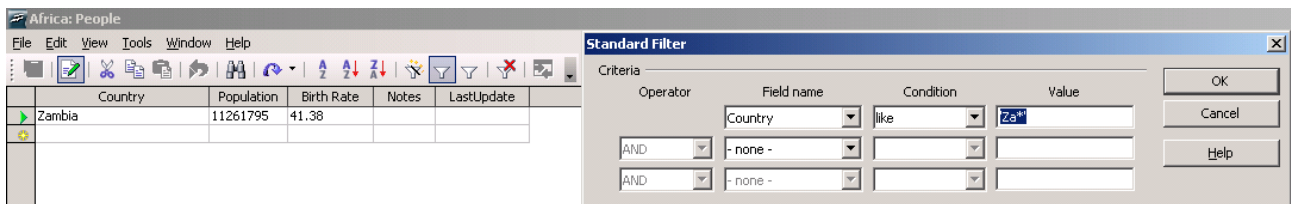
You have the option of scrolling through the records and individually replacing or not. Alternatively, you can do a global replacement which will make the changes to all the records at once.



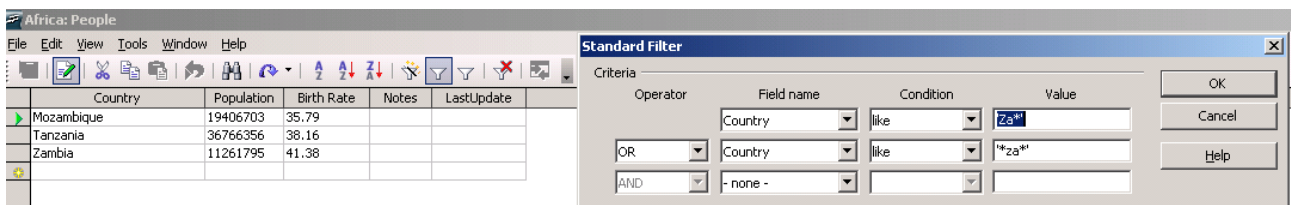
5.4.1.2 Apply a filter to a table, form.

A **filter** selects all records which satisfy certain conditions.

- Open the **People** table. The **toolbar** contains four icons relating to **filters**. These are **Autofilter**, **Apply Filter**, **Standard Filter** and **Cancel Filter**.
- Click the **Standard Filter** icon.
- Fill in the dialogue as shown on the following screen and click **OK**.

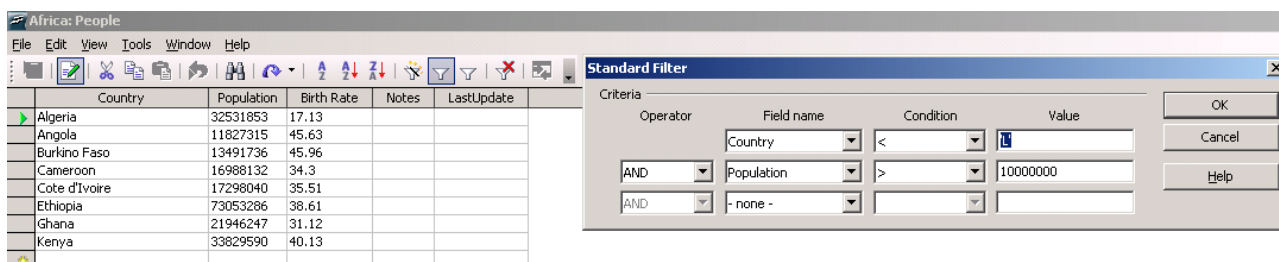


- Click the **Standard Filter** once more.
- Complete the dialogue as shown below and press **OK**.



In this case, records satisfying either the first or the second condition will be displayed. We could set a third alternative if we wished. It is important to note that in the case of **OR**, records only need satisfy one of the conditions in order to be displayed. If we were to use **AND**, all the conditions would need to be satisfied.

- Click the **Standard Filter** icon once more.
- Edit the dialogue as shown on the following screen and press **OK**.



The first condition means that the **Country** must begin with a letter preceding **L** in the alphabet. The second condition means that the **Population** must be **greater than** 10,000,000. Because **AND** is used, **both** conditions must be satisfied by each record.

- Conditions can be:**
- = : Equal to numerically or identical to if text.
 - <> : Not equal to
 - > : Greater than or after
 - >= : Greater than or equal to
 - < : Less than or before
 - <= : Less than or equal to
 - Like** : Matches a string which may include wildcards
 - Not Like**: Does not match a string which may include wildcards
 - NULL**: Contains nothing
 - Not NULL**: Contains something

Base will remember the last filter that was applied. The **Apply Filter** acts as a **toggle**. If the filter is applied, clicking it will remove the effects of the filter without actually clearing the filter. Clicking it a second time will reapply the filter.

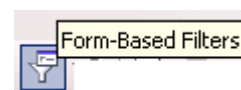
The **Autofilter** has a special function. It filters records based on the current record.

- Place the cursor in a field name whose content you want to filter and then click the **AutoFilter** icon.
- Only those records with content identical to the selected field name are visible.

Filters on forms

The action of filters on forms is similar to that on tables.

- Open the **People form** for data entry.
- Click the **Form-Based Filters** icon on the **toolbar**.



The current document is displayed with its form controls as an empty edit mask. The **Form Filter** toolbar appears.

- Enter the filter conditions into one or several fields.
Note that if you enter filter conditions into several fields, all of the entered conditions must match (**Boolean AND**).
You may use **wildcards** in the conditions.
- Click the **Apply Form-Based Filter** icon on the **Form Filter** toolbar.
The filter will be applied.
- Browse through the found records using the **Form Navigation** toolbar.
- Click the **Apply Filter** icon on the **Form Navigation** toolbar to change the filtered view.



5.4.1.3 Remove a filter from a table, form.

- Click the **Remove Filter** icon.
This not only removes the application of the filter from the table or form, but actually removes the definition of the filter itself.



5.4.2 Queries

5.4.2.1 Create and save a single table query, two-table query using specific search criteria.

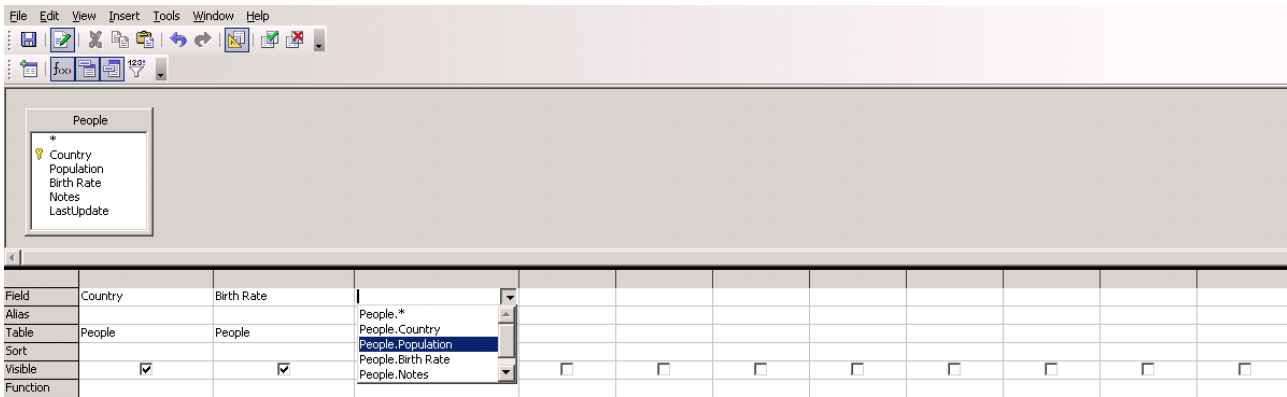
A query provides a method of extracting records that satisfy certain criteria either from a single table or a group of related tables.

In this section we will construct two queries without conditions, one based on a single table and the other based on two related tables. In the next section we will add conditions to these.

Single table queries

- Go to **Query view** by clicking on **Queries** in the **Database pane**.
- If you have already created the query **Populous Countries**, delete it by selecting it and pressing the **Del** key. Confirm that you wish to delete it.
- Click **Create Query in Design view** in the **Tasks pane**.
- When the **Add Tables** dialogue appears, select **People** and click **Add**. Then click **Close**.
- In the **Field** cell of the first column, select **People.Country**.
- In the second and third columns, select **People.Birth Rate** and **People.Population** respectively.
Notice that in creating the query, we do not need to use all the fields and we can place them in a different order to the table.

5.4 OpenOffice.org Base: Retrieving Information

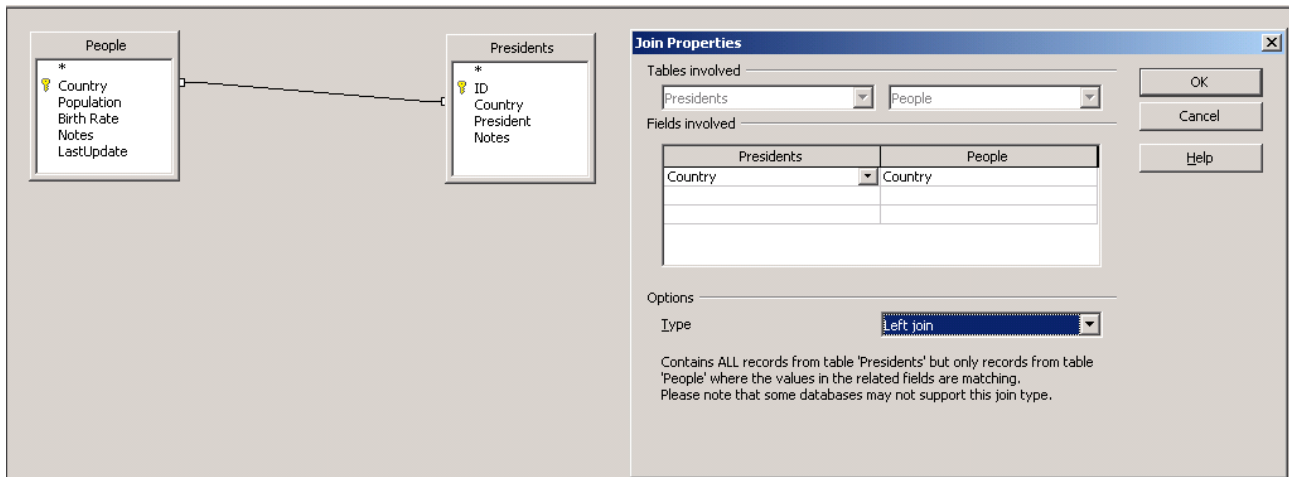


- Close and save changes.
- Give the query the name **Population**.
- Double click on **Population**.

Country	Birth Rate	Population
Algeria	17.13	32531853
Angola	45.63	11827315
Burkina Faso	45.96	13491736
Cameroon	34.3	16988132
Cote d'Ivoire	35.51	17298040
Ethiopia	38.61	73053286
Ghana	31.12	21946247
Guinea	42.01	9452670
Kenya	40.13	33829590
Madagascar	41.66	18040341
Malawi	43.39	12707464
Morocco	22.29	32725847
Mozambique	35.79	19406703
Namibia	25.16	2030692
Niger	51.33	12162856
Nigeria	40.65	128765768
Rwanda	40.6	8440820
Senegal	33.42	11706498
South Africa	18.48	44344136
Sudan	35.17	4187486
Tanzania	38.16	36766356
Uganda	47.39	27269482
Zambia	41.38	11261795
Zimbabwe	28.22	12160907

- Close the query.
- Click on **Create Query in Design View**.
- Add both the **People** and **Presidents** tables.
- Close the **Add Tables** dialogue.
- Click on **Country** in the **People** table, hold down the left mouse button and drag onto **Country** in the **Presidents** table.
- Double click on the join and select **Left Join** in the **Type** drop down window.

5.4 OpenOffice.org Base: Retrieving Information



- Click **OK**.
- Select **Presidents.Country**, **Presidents.President** and **Country.Population** for the first three fields of the query.
- Close and save changes.
- Give the name **Presidents and Populations** to the query.
- Double click on **Presidents and Populations**.

The screenshot shows the 'Africa: Presidents and Populations' query result table. The table has three columns: 'Country', 'President', and 'Population'. The data rows are:

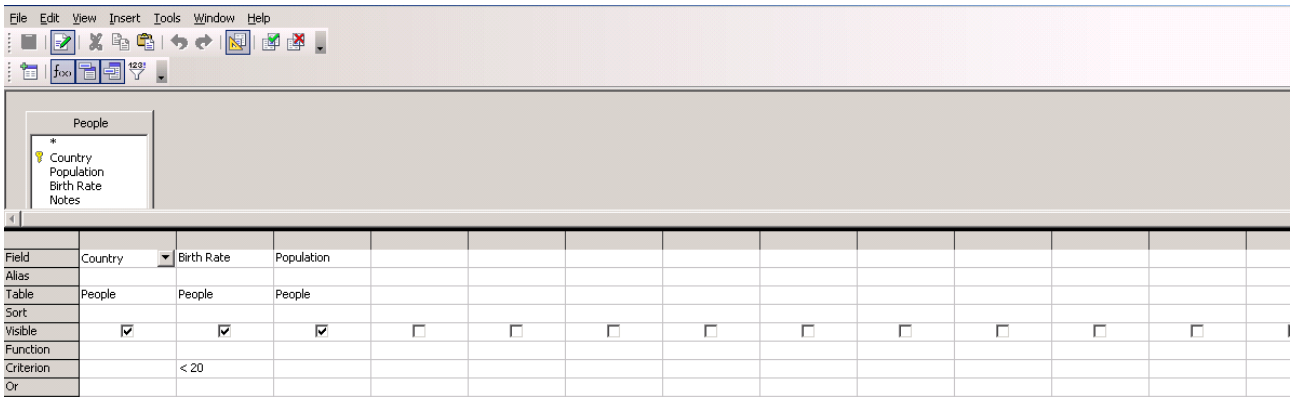
Country	President	Population
South Africa	Nelson Mandela	44344136
South Africa	Thabo Mbeki	44344136
Kenya	Mwai Kibabki	33829590
Kenya	Daniel Arap Moi	33829590
South Africa	FW de Klerk	44344136
Ghana	Jerry Rawlings	21946247

5.4.2.2 Add criteria to a query using any of the following operators: < (Less than), <= (Less than or equals), > (Greater than), >= (Greater than or equals), = (Equals), <> (Not equal to), And, Or.

A query provides one of the essential mechanisms for extracting information from data. Not only does it allow us to specify which fields we wish to see, but also to select only those records that satisfy certain conditions.

- Open the **Population query** for editing.
- Edit the query as shown on the screen below.
This will list the countries which have birth rates below 20 per 1000.

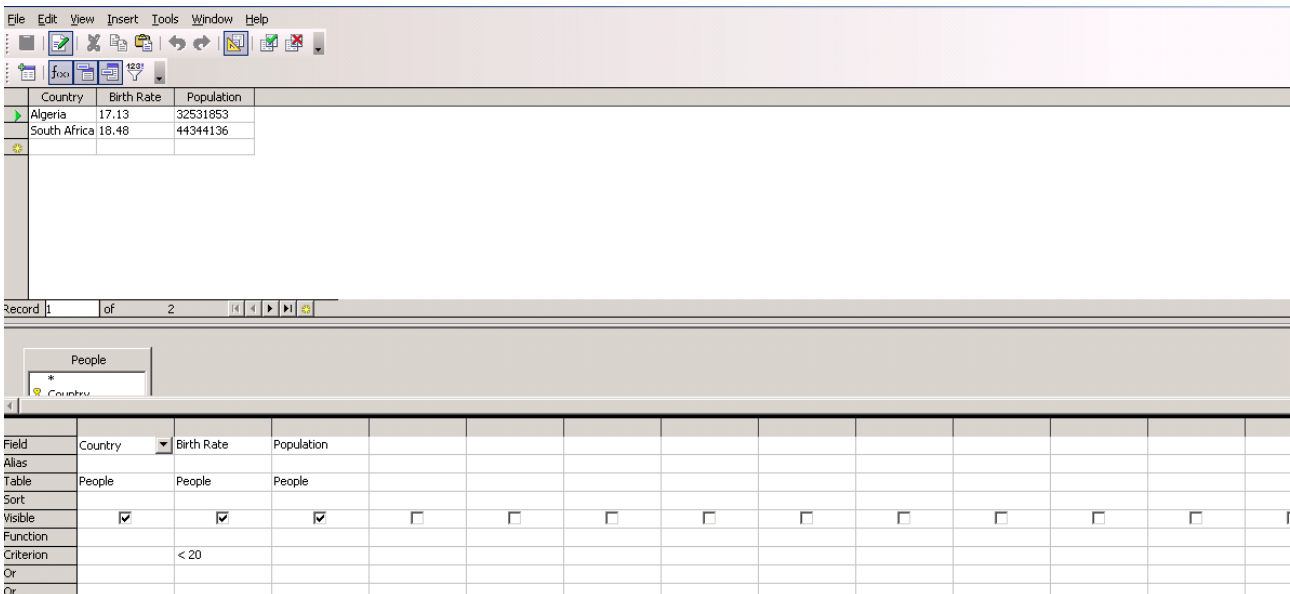
5.4 OpenOffice.org Base: Retrieving Information



- **Edit » Run Query** OR click the **Run Query** icon .



As the next screen shows, **Run Query** allows us to see both the query and its effects. We can alter the query and execute the command as often as we need.



- Modify the conditions as shown below and execute **Run Query**.

5.4 OpenOffice.org Base: Retrieving Information

The screenshot shows the OpenOffice.org Base interface. At the top, there is a menu bar (File, Edit, View, Insert, Tools, Window, Help) and a toolbar with various icons. Below the toolbar is a 'Run Query' button. The main area displays a table with the following data:

Country	Birth Rate	Population
Morocco	22.29	32725847
Namibia	25.16	2030692
Zimbabwe	28.22	12160907

Below the table, there is a status bar showing 'Record 1 of 3'. Below that is a 'People' table with a search filter 'Country'. At the bottom, there is a query design grid with the following fields and criteria:

Field	Country	Birth Rate	Population	Birth Rate									
Alias													
Table	People	People	People	People									
Sort													
Visible	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Function													
Criterion		> 20		< 30									
Or													

Explanation: This is an important example. We wanted to display countries that have a birth rate greater than 20 but less than 30. To do so we need two conditions, >20 AND <30. Because of the **AND**, they must both appear on the same row. To do this, we add another **People.Birth Rate** column but uncheck the **Visible** option. We can then set an additional constraint on the field.

There is an **AND** between all conditions on the same row and an **OR** between conditions on different rows. Be sure you understand the difference between these very clearly. A good way of doing so is to experiment with a query such as the one above. Try out different situations so that you can see the effects.

There are a number of operators that can be used in queries.

For example:

Operators can be: = : Equal to numerically or identical to if text.

<> : Not equal to

> : Greater than or after

>= : Greater than or equal to

< : Less than or before

<= : Less than or equal to

And : Will return information that lies between the two values x and y.

Or : Will return information that lies between the two values x or y.

Criteria listed for Country field

=South Africa (will show only entries for South Africa)

<> South Africa (will show all entries excluding South Africa)

South Africa OR Namibia (will return all South African and Namibian entries)

Criteria listed for Birth Rate field

>25 (will list all entries that have a birth rate above 25)

>=25 (will list all entries that have a birth rate 25 and above)

<25 (will list all entries that have a birth rate below 25)

<=(will list all entries that have a birth rate 25 and below)

>=25 AND <=30 (will return all entries 25 to 30)

5.4.2.3 Edit a query by adding, removing criteria.

If you press the **Clear Query** icon, not only the conditions but also the fields themselves will be cleared in the query window.



You would only use this if you wish to start completely from scratch again with a query.

If you wish to delete a field from a query, click on the field heading and press **Del**.

Usually we simply edit the **Conditions** and then execute **Run Query**.

To illustrate some of the ideas above, run the following two queries.

Important: Enclose the **J** within quotes, thus **'J'**.

The screenshot shows the OpenOffice.org Base interface. At the top, there is a menu bar (File, Edit, View, Insert, Tools, Window, Help) and a toolbar. Below the toolbar is a data table with the following data:

Country	Birth Rate	Population
Algeria	17.13	32531853
Angola	45.63	11827315
Burkina Faso	45.96	13491736
Cameroon	34.3	16988132
Cote d'Ivoire	35.51	17298040
Ethiopia	38.61	75053286
Ghana	31.12	21946247
Guinea	42.01	9452670
South Africa	18.48	44344136

Below the table, the status bar shows "Record 1 of 9". The query window is open, showing the table name "People" and a search field containing "Country". The query design grid is visible below the query window:

Field	Country	Birth Rate	Population									
Alias												
Table	People	People	People									
Sort												
Visible	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Function												
Criterion		< 20										
Or	<'J'											
Or												

The screenshot shows the OpenOffice.org Base interface. At the top, there is a menu bar (File, Edit, View, Insert, Tools, Window, Help) and a toolbar. Below the toolbar is a data table with the following data:

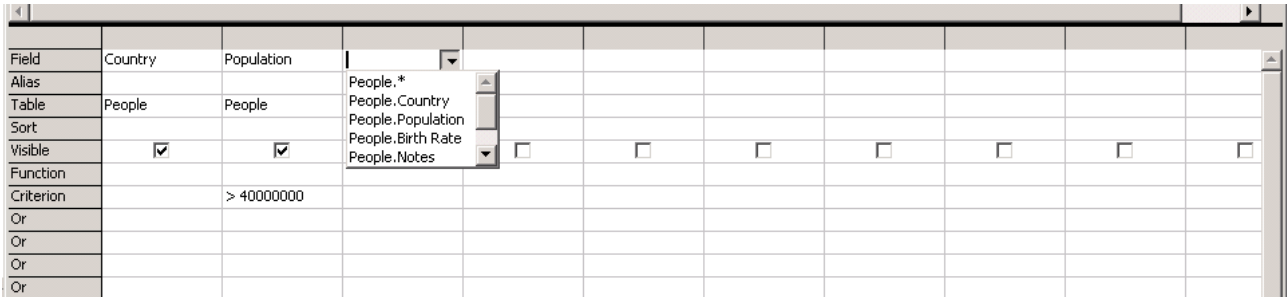
Country	Birth Rate	Population
Algeria	17.13	32531853

Below the table, the status bar shows "Record 1 of 1". The query window is open, showing the table name "People" and a search field containing "Country". The query design grid is visible below the query window:

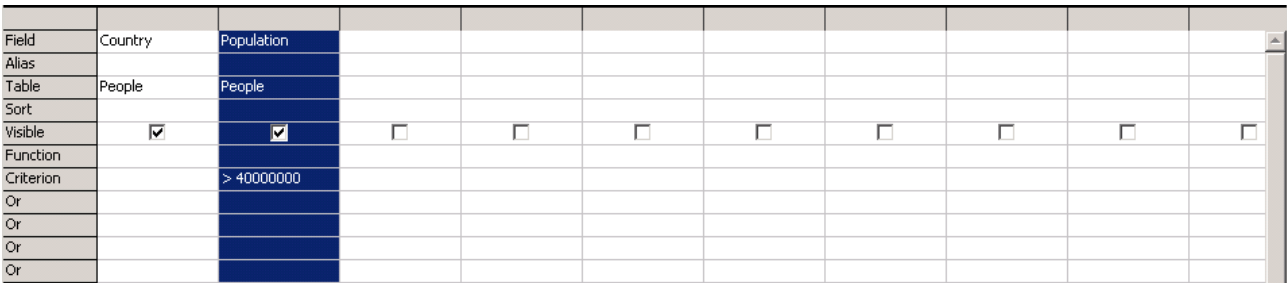
Field	Country	Birth Rate	Population									
Alias												
Table	People	People	People									
Sort												
Visible	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Function												
Criterion	<'J'	< 20										
Or												
Or												

5.4.2.4 Edit a query: add, remove, move, hide, unhide fields.

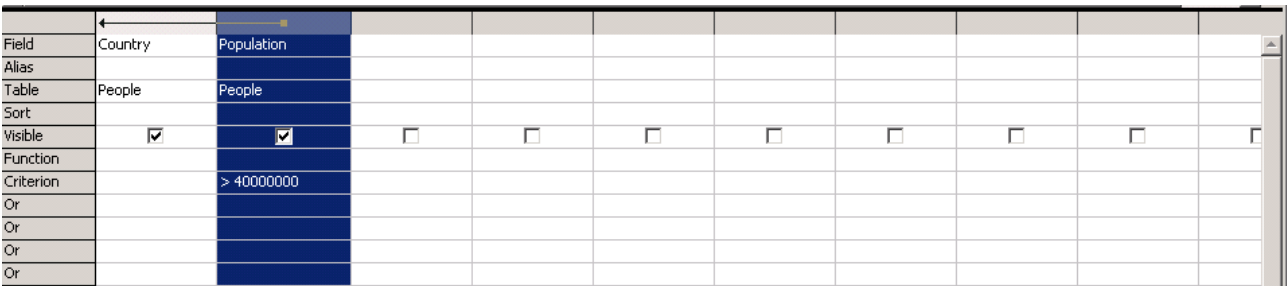
- **To add a new field**, click on the **Field** cell at the top of a blank column.
- Select a field from the drop down window.



- **To delete an existing field**, click the grey cell at the top of the column.



- Press **Del**.
- **To move a field**, click and hold down the left mouse key on the grey cell at the top of the column.
- Drag the column to the new position.



You will notice that an arrow is displayed indicating the position to which the field will be moved.

To hide/unhide a field. Often we wish to have a field in the query but do not wish to display it. Fields can be hidden or unhidden using the **Visibility** check box. If you do not wish a field to be displayed when the query is run, uncheck this box.

5.4.2.5 Run a query.

This was discussed in section 5.4.2.4.

5.4.2.6 Delete a query.

- Click **Queries** in the **Database** pane.
- Select the **query**.
- Press **Del**.
-

5.4.2.7 Save and close a query.

This was discussed in section 5.4.2.1.

5.4.3 Sort Records

5.4.3.1 Sort data in a table, form, query output, in ascending, descending numeric, alphabetic order.

Sorting Tables

- Click in the column on which you wish to sort.
- Click on the **Sort Ascending** or **Sort Descending** icons.



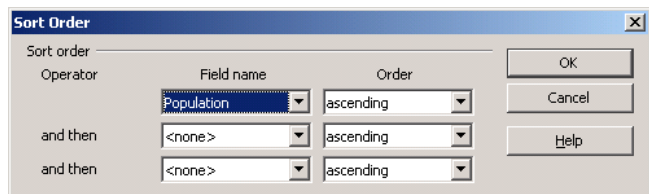
If the field is numeric, **sort ascending** will sort the table from the smallest to the largest value. If the field is text, then it will sort alphabetically starting with A. **Sort descending** will sort numeric data placing the largest first and will sort text data reverse alphabetically.

If the field on which you are sorting contains duplicates, you might want to sort on more than one field. For example, the first sort key might be **Surname**. If surnames are duplicated, you could sort records with the same surname on their **First Name** as the second sort key.

- For compound searches, click the **Sort** icon.
This icon does not have a direction arrow on the side.



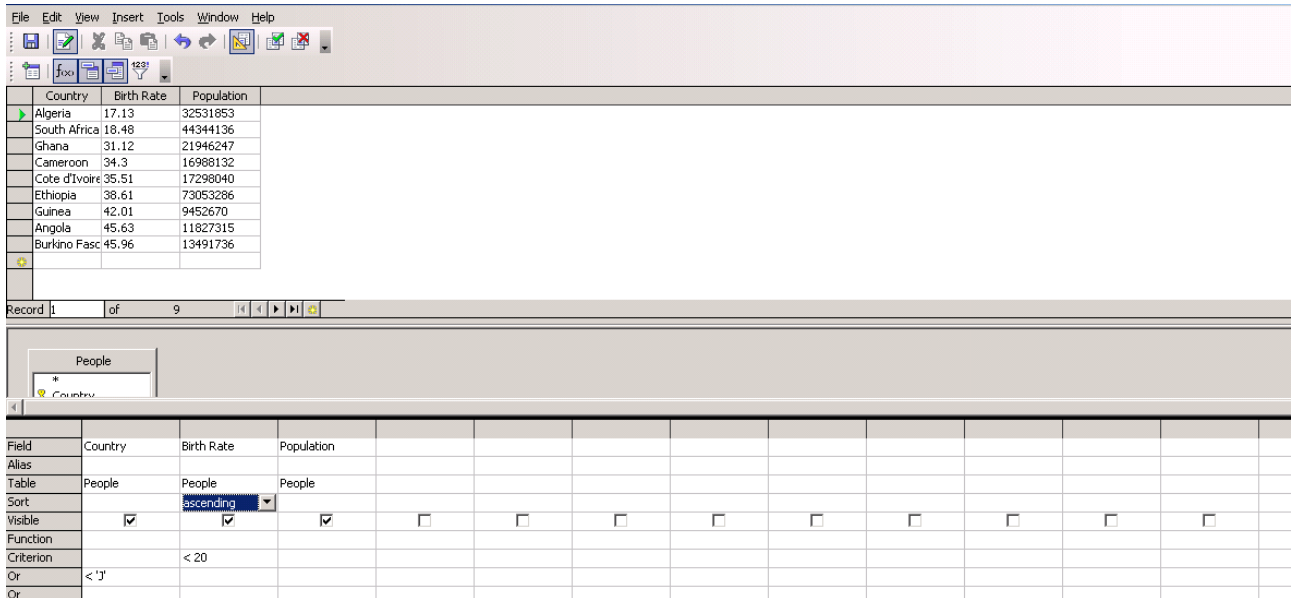
- Select fields for the first, second and third sort keys.
- Choose whether each of these keys should be ascending or descending.
- Click **OK**.



Sorting Queries

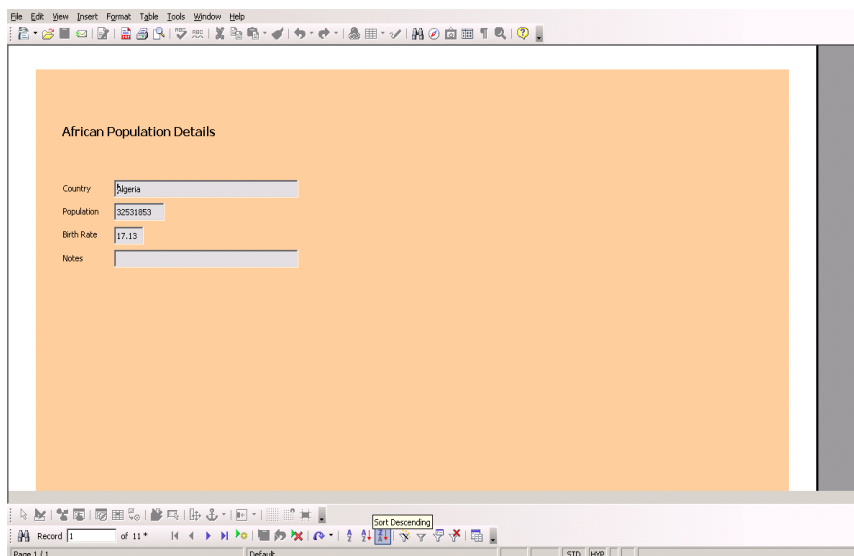
Queries can be sorted in exactly the same way.

In addition, sorting can be built into the definition of the query itself as shown on the following screen by selecting **Ascending** or **Descending** for the **Sort** option for a field.



Sorting forms

- Open the form for data entry and viewing.
- Click on the field on which you wish to sort the form.
- Click the **Sort Ascending** or **Sort descending** icons on the toolbar as shown in the next screen.
Base will then sort the records according to this field and the sort order selected.



Module 5: OpenOffice.org Base

Section 5: Reports

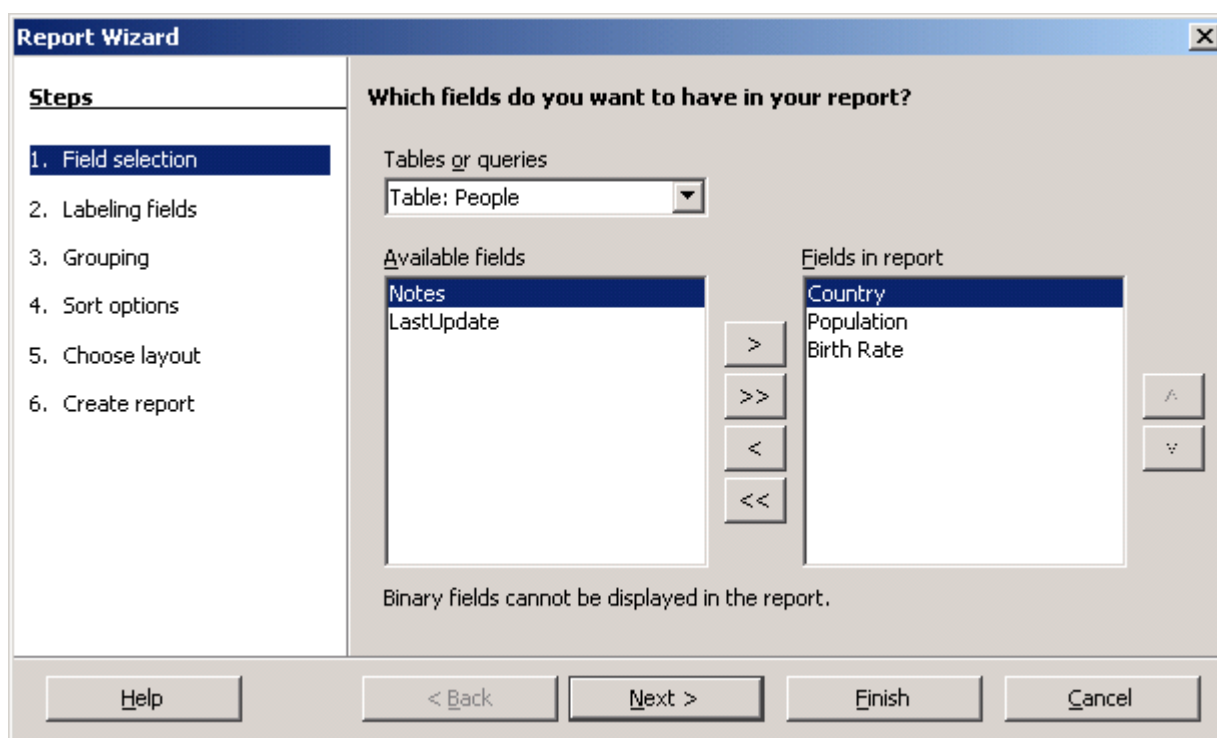
5.5 Reports

5.5.1 Working with Reports

5.5.1.1 Create and save a report based on a table, query.

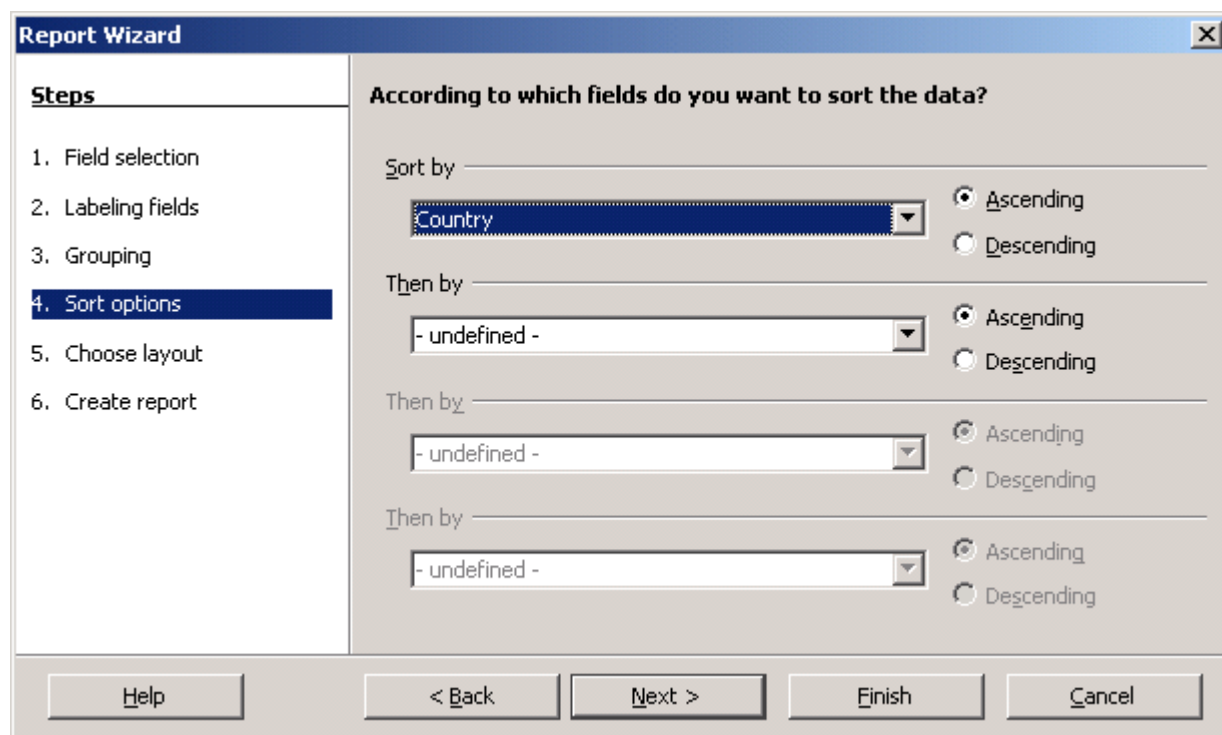
A report is a highly formatted output document summarising information derived from tables or queries. It is generally designed to be printed.

- Open the **Africa** database.
- Click on **Reports** in the **Database pane**.
- Click **Use Wizard to Create Report**.
- In the **Tables** drop down window, select **People**.
- Double click the fields, **Country**, **Population** and **Birth Rate**.

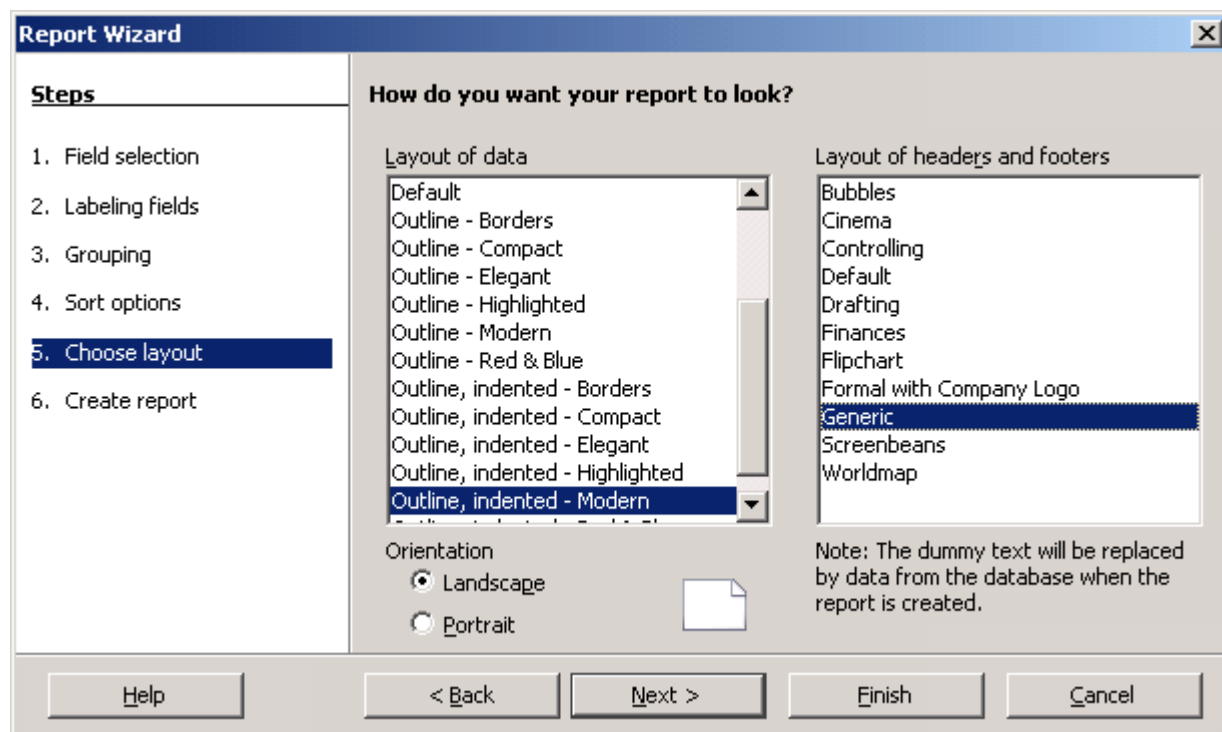


Note: At this point you could create a report based on either a **table** or a **query**. The process is exactly the same.

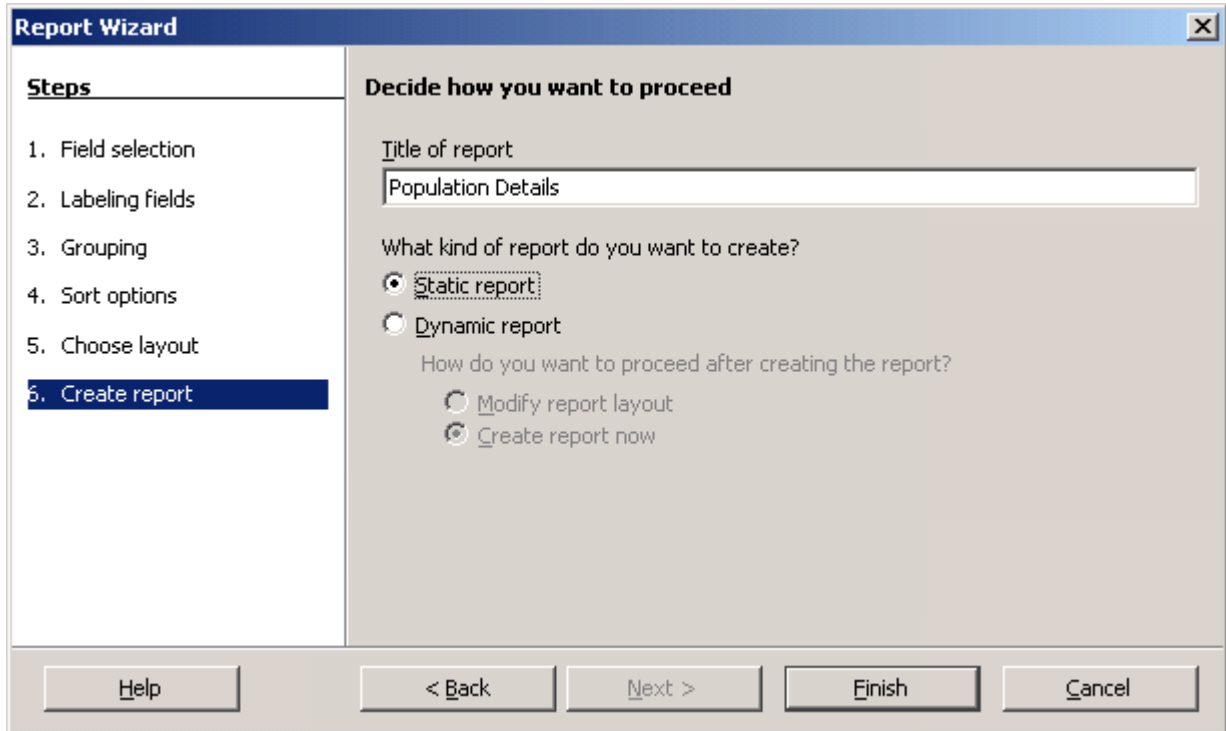
- Click **Next** three times to skip the next few screens until you get to the **Sort options** dialogue.
- In **Sort by**, select **Country** and check the **Ascending** radio button.



- Click **Next**.
- Choose a **Layout**.

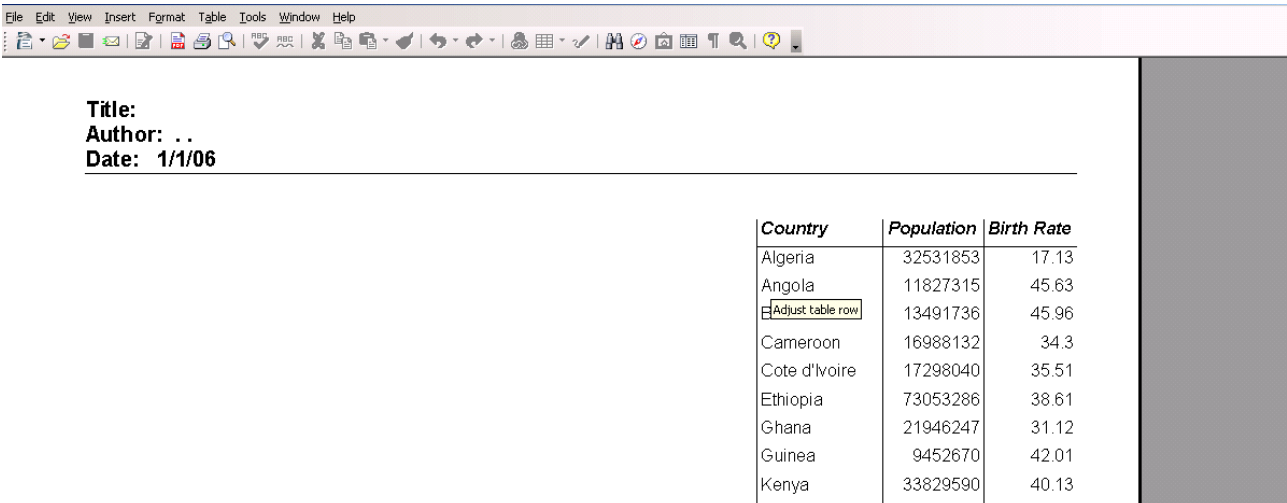


- Click **Next**.
- Give the report a name.



Important: The previous dialogue also allows you to create a **Static** or a **Dynamic** report. A **static** report retains the data at the time the report was created. A **dynamic** report is actually a template for the report. The data is updated each time the underlying table or query changes.

- Check the **Static report** radio button.
- Click **Finish**.



Note: The report is a standard **Writer** document.

- **File » Save Copy As** to save the document.
- **File » Print.**
- Click the **Close** icon in the top right hand corner of the screen to end.

5.5.1.2 Change arrangement of data fields and headings within a report layout.

- Edit the column headings as you would any text in an ordinary document.
In the following screen, the **field name Country** has been changed to an ordinary text heading **State**.

Title: Populations Details of African Countries Based on CIA Factbook 2005 Date: 1/1/06		
State	Population	Birth Rate
Algeria	32531853	17.13

Columns can be moved as follows:

- Position the cursor in the **State** column of the report.
- **Table » Insert » Columns » After.**
- Position the cursor in the **Birth Rate** column.
- **Table » Select » Columns.**
- **Edit » Cut.**
- Position the cursor in the new blank column.
- **Edit » Paste.**
- Position the cursor in the blank column.
- **Table » Delete » Columns.**
- Readjust the column widths.
- **File » Close.**

5.5.1.3 Group data under a specific heading (field) in a report in ascending, descending order.

- Edit the **People** table to include an additional field called **Region** as shown on the next screen.

Field Name	Field Type	Description
Country	Text (fix) [CHAR]	
Population	Integer [INTEGER]	
Birth Rate	Real [REAL]	
Notes	Memo [LONGVARCHAR]	
LastUpdate	Date [DATE]	
Region	Text (fix) [CHAR]	

Field Properties

Entry required: No

Length: 20

Default value:

Format example: @

5.5 OpenOffice.org Base: Reports

- Close and accept the changes.
- Add a region for each record as shown on the adjacent screen.
- Close and accept changes.

Country	Population	Birth Rate	Notes	LastUpdate	Region
Algeria	32531853	17.13			North
Angola	11827315	45.63			South
Burkina Faso	13491736	45.96			West
Cameroon	16988132	34.3			Central
Cote d'Ivoire	17298040	35.51			West
Ethiopia	73053286	38.61			North
Ghana	21946247	31.12			West
Guinea	9452670	42.01			West
Kenya	33829590	40.13			East
Madagascar	18040341	41.66			East
Malawi	12707464	43.39			Central
Morocco	32725847	22.29			North
Mozambique	19406703	35.79			South

- Click on **Reports** in the **Database pane**.
- Click **Use Wizard to Create New Report**.
- Following the following screens.

Report Wizard

Steps

1. Field selection
2. Labeling fields
3. Grouping
4. Sort options
5. Choose layout
6. Create report

Which fields do you want to have in your report?

Tables or queries
Table: People

Available fields
Notes
LastUpdate

Fields in report
Country
Population
Birth Rate
Region

Binary fields cannot be displayed in the report.

Help < Back Next > Finish Cancel

Report Wizard

Steps

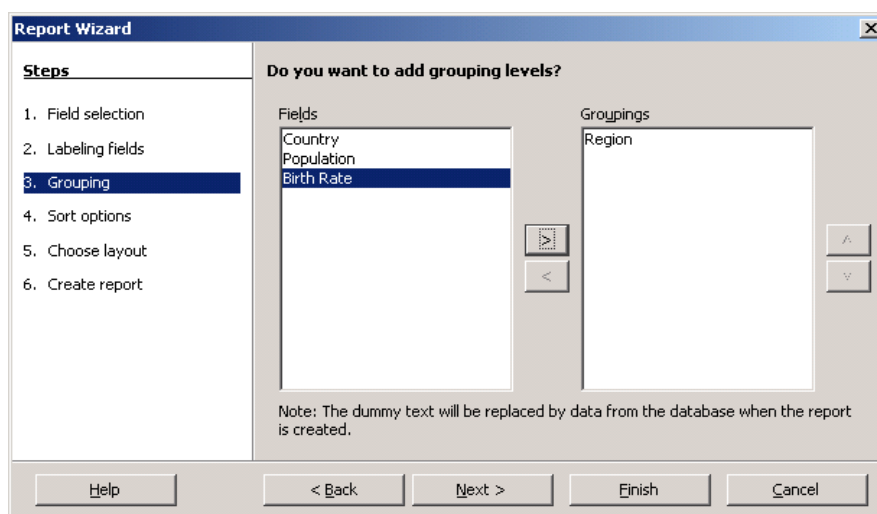
1. Field selection
2. Labeling fields
3. Grouping
4. Sort options
5. Choose layout
6. Create report

How do you want to label the fields?

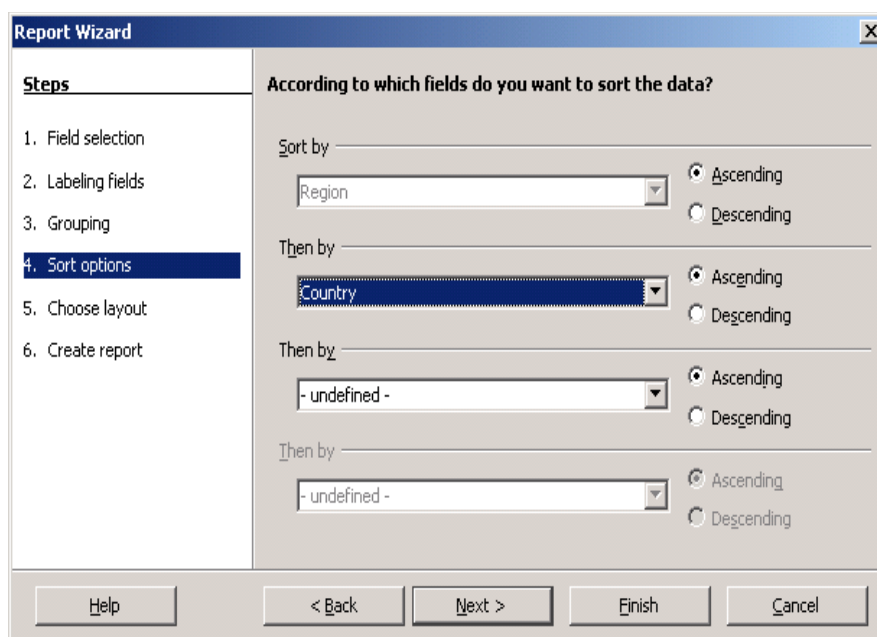
Field	Label
Country	Country
Population	Population
Birth Rate	Birth Rate
Region	Region

Help < Back Next > Finish Cancel

When you get to the **Grouping** dialogue, group by **Region**.



- Click **Next**.
- **Sort by Region** is already selected. Add **Sort by Country**. This will sort countries alphabetically within each region.



- Click **Next**.
- Complete the report creation as before and give it the title **Populations by Region**.

If you used the default layout, the report would appear as follows:

5.5 OpenOffice.org Base: Reports

Region	Central																		
	<table border="1"> <thead> <tr> <th>Country</th> <th>Population</th> <th>Birth Rate</th> </tr> </thead> <tbody> <tr> <td>Cameroon</td> <td>16988132</td> <td>34.3</td> </tr> <tr> <td>Malawi</td> <td>12707464</td> <td>43.39</td> </tr> <tr> <td>Zambia</td> <td>11261795</td> <td>41.38</td> </tr> </tbody> </table>	Country	Population	Birth Rate	Cameroon	16988132	34.3	Malawi	12707464	43.39	Zambia	11261795	41.38						
Country	Population	Birth Rate																	
Cameroon	16988132	34.3																	
Malawi	12707464	43.39																	
Zambia	11261795	41.38																	
Region	East																		
	<table border="1"> <thead> <tr> <th>Country</th> <th>Population</th> <th>Birth Rate</th> </tr> </thead> <tbody> <tr> <td>Kenya</td> <td>33829590</td> <td>40.13</td> </tr> <tr> <td>Madagascar</td> <td>18040341</td> <td>41.66</td> </tr> <tr> <td>Rwanda</td> <td>8440820</td> <td>40.6</td> </tr> <tr> <td>Tanzania</td> <td>36766356</td> <td>38.16</td> </tr> <tr> <td>Uganda</td> <td>27269482</td> <td>47.39</td> </tr> </tbody> </table>	Country	Population	Birth Rate	Kenya	33829590	40.13	Madagascar	18040341	41.66	Rwanda	8440820	40.6	Tanzania	36766356	38.16	Uganda	27269482	47.39
Country	Population	Birth Rate																	
Kenya	33829590	40.13																	
Madagascar	18040341	41.66																	
Rwanda	8440820	40.6																	
Tanzania	36766356	38.16																	
Uganda	27269482	47.39																	
Region	North																		
	<table border="1"> <thead> <tr> <th>Country</th> <th>Population</th> <th>Birth Rate</th> </tr> </thead> <tbody> <tr> <td>Algeria</td> <td>32531853</td> <td>17.13</td> </tr> <tr> <td>Ethiopia</td> <td>73053286</td> <td>38.61</td> </tr> </tbody> </table>	Country	Population	Birth Rate	Algeria	32531853	17.13	Ethiopia	73053286	38.61									
Country	Population	Birth Rate																	
Algeria	32531853	17.13																	
Ethiopia	73053286	38.61																	

5.5.1.4 Present specific fields in a grouped report by sum, minimum, maximum, average, count, at appropriate break points.

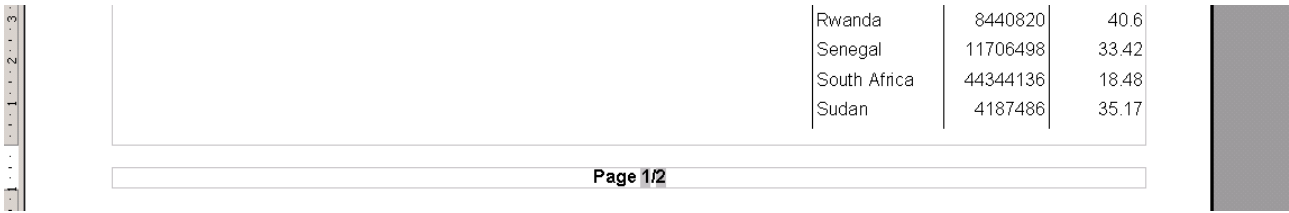
At present, this cannot be done in Base.

5.5.1.5 Add, modify text in Headers, Footers in a report.

- Right click on the **African Populations** report.
- Click **Edit**.
- Edit the **report header** as shown in the next two screens.

Country	Population	Birth Rate
Algeria	32531853	17.13
Angola	11827315	45.63
Burkina Faso	13491736	45.96
Cameroon	16988132	34.3

- Scroll down to the bottom of the screen and centre the page numbering in the **report footer** as shown on the next screen.



Rwanda	8440820	40.6
Senegal	11706498	33.42
South Africa	44344136	18.48
Sudan	4187486	35.17

Page 1/2

- **File » Save.**

5.5.1.6 Delete a report.

- Click **Reports** in the **Database pane**.
- Click on the report you wish to delete.
- Press **Del**.
- Confirm the deletion.

5.5.1.7 Save and close a report.

This was covered in section 5.5.1.1.

Module 5: OpenOffice.org Base

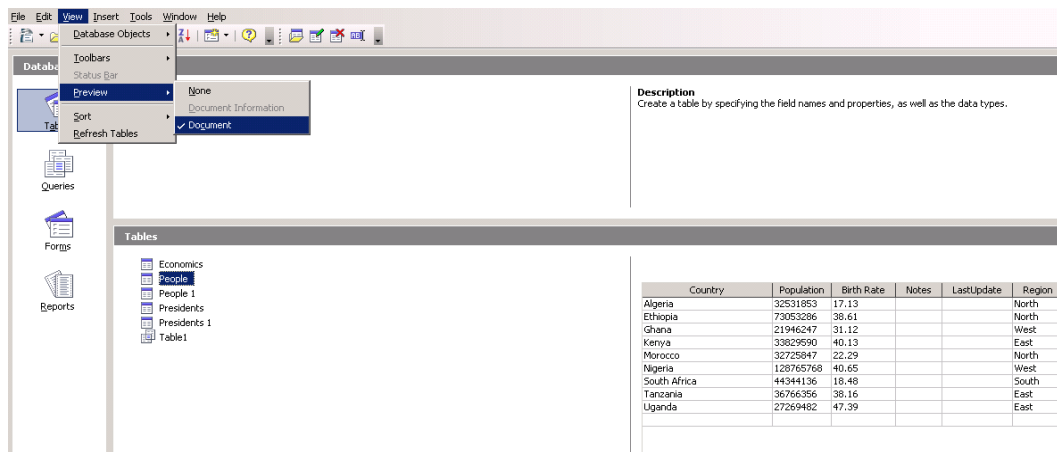
Section 6: Prepare Outputs

5.6 Prepare Outputs

5.6.1 Prepare to Print

5.6.1.1 Preview a table, form, report.

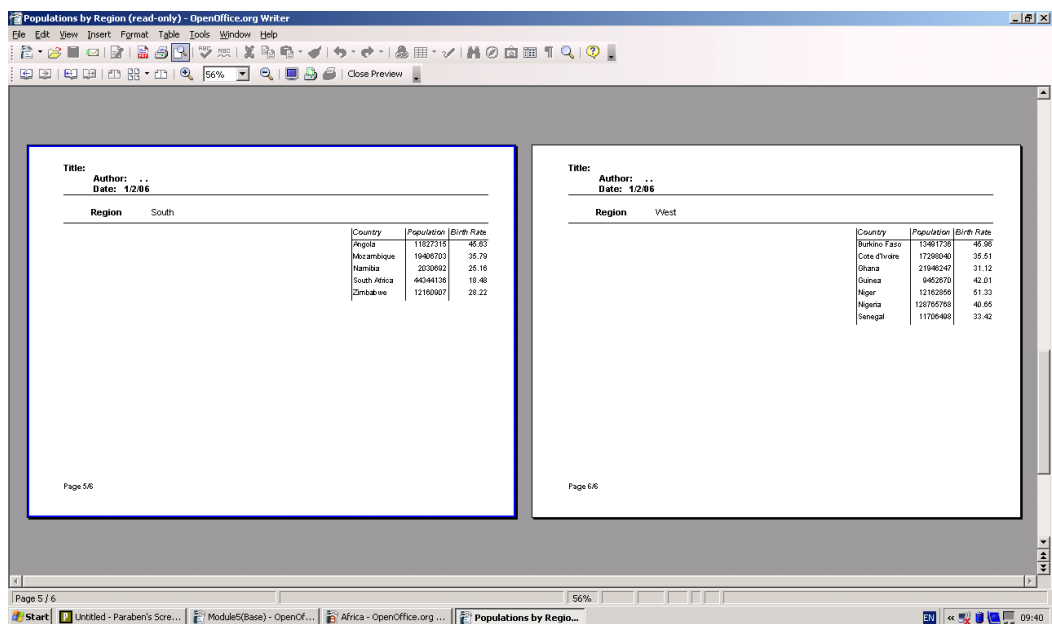
- **View » Preview.**
The current table, query, form or report will be displayed in a preview pane.
- Click on a different object and it will be previewed.



- To close **Preview mode: View » Preview.**

Forms and **reports** can be previewed in addition as follows.

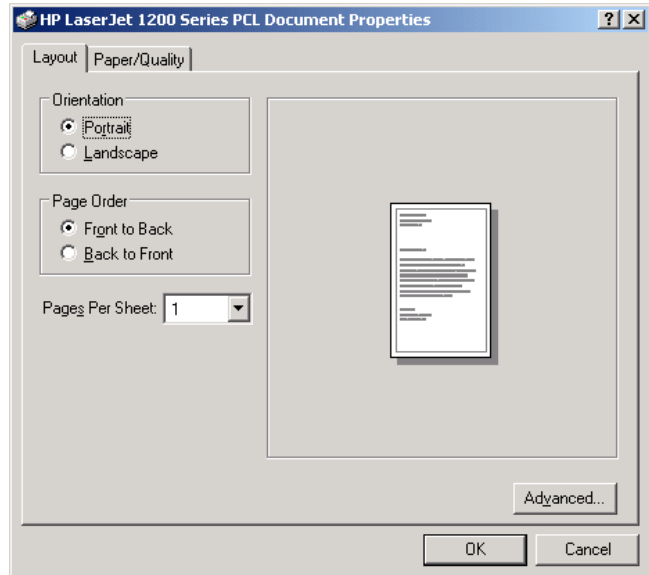
- Open any form or report for viewing
- **File » Page Preview.**



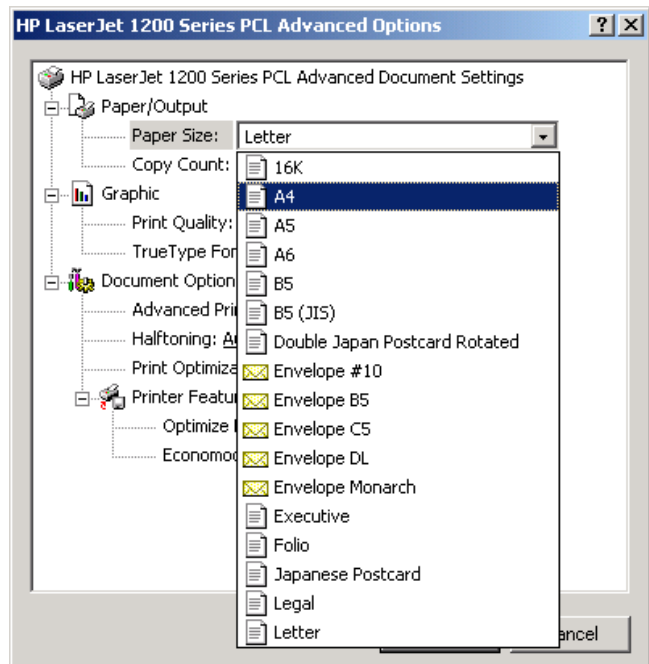
- Click the **Close** icon in the top right hand corner when done.

5.6.1.2 Change report orientation: portrait, landscape. Change paper size.

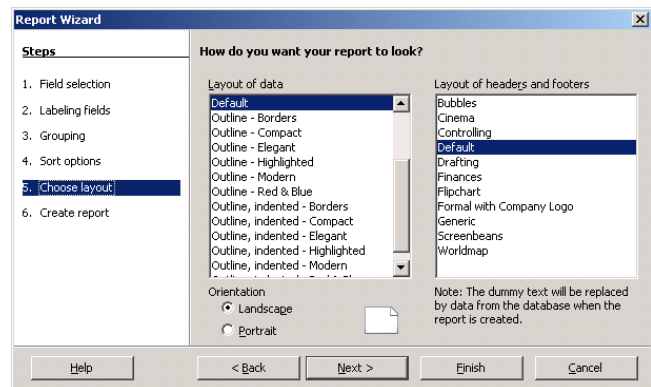
- Open the report for editing.
- **File » Printer Settings » Properties.**
- Click the **Layout** tab.
- Set the **orientation** to **portrait** or **landscape**.



- Click **Advanced.**
- Set the **paper size.**
- Click **OK.**



The orientation of the report can also be set during stage 5 of the creation process. The default layout is **landscape**.



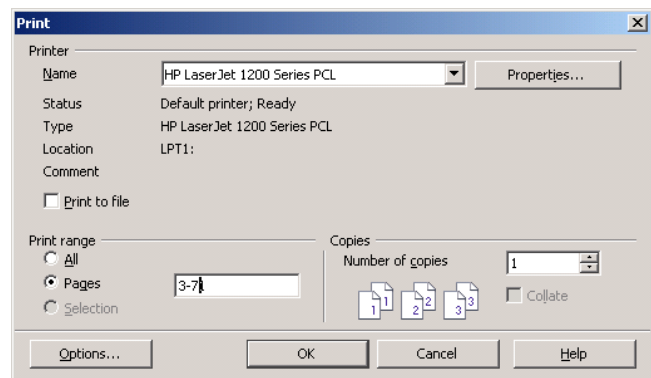
5.6.2 Print Options

5.6.2.1 Print a page, selected record(s), complete table.

This option is not available in Base.

5.6.2.2 Print all records using form layout, specific pages using form layout.

- Open a form for viewing.
- **File » Print.**
- in **Print range**, either
Click **All** to print all records
OR
Click **Pages** and inserted a range such as **3-7** or insert a list separated by commas such as **3,5,6,9**
- Click **OK**.



When a form is displayed, only the current page can be printed. This is done using the **File » Print** command.

5.6.2.3 Print the result of a query.

This option is not available in Base.

5.6.2.4 Print specific page(s) in a report, complete report.

The process of printing an entire report or a range of pages is identical to that described in 5.6.2.2 for printing all records or a range of records in form view.