

QlikView

Tutorial

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INTRODUCTION

- **What is QlikView?**
- **About the Tutorial**
- **Basics**



What is QlikView?

QlikView is a software that makes it possible to retrieve and assimilate data from different sources. Once loaded into the program, the data is presented in a way that is easy to understand and work with.

To make selections in QlikView, you don't need any previous knowledge of databases or search routines: you simply click on the item of which you want to know more. The clicked item turns green, and the program immediately presents all the items associated with the selected one.

Graphics and tables can be created to get an even better overview of data. Any graphic or table can be printed or exported to other programs.

QlikView can be downloaded for free, as a Personal Edition. With QlikView Personal Edition you can make full use of the QlikView functionality, but it is not possible to open documents created by other users. To do this, you need a QlikView license.

The QlikView product group also includes QlikView Server and QlikView Publisher that can be used for distribution of documents to several users and for automated updates etcetera. See www.qlikview.com for more information.



QlikView training

Apart from the Tutorial there are several other courses available, both classroom training and online e-learning, ranging from the most basic beginner level to more advanced levels. You can register for courses in your regions, find out about new e-learning and download a course guide on www.qlikview.com (select **Services - Training**).

The start page in QlikView (under the **Help** menu you select **Show start page**) also contains links to example files and other information about the software. Click **Getting Started**, then **Learn more about QlikView** on the start page to find out more.



About the Tutorial

The *Tutorial* consists of three parts: *Working with QlikView*, *Creating a document*, and *Advanced Features*. All the parts contain lessons that take you step by step through various features.

To go through the steps in this *Tutorial*, you need the folder *Tutorial*, which you can download from the **Getting started** tab of the QlikView start page.

You can also download the latest Tutorial files and the Tutorial PDF file from www.qlikview.com. You find the files under *Services - Training - Free Training*.

Before you start working with the lessons, read the two following sections of this introduction, *Conventions* and *Basic*. *Conventions* informs you about the terms used in the *Tutorial*, whereas *Basics* familiarizes you with basic actions such as starting QlikView, opening, saving and closing an application, and using the help.

The first part, *Working with QlikView*, shows you how to work with an existing application. This part introduces the components of a QlikView application and demonstrates the use and creation of these components. In addition, *Working with QlikView* thoroughly describes how to search in QlikView. If you do not want to load your own data, this part is all you need to review.

The second part, *Creating a document*, presents the procedure of loading data into QlikView. You will learn how to load data from different sources, how QlikView builds associations between different sets of data and how to link external information to the data. If you are going to build applications, this part is crucial for you.

Finally, *Advanced Features* can be seen as a continuation of both the previous parts. Here you will learn how to build more complicated documents, as well as how to use more advanced features in the script. Access restriction and number formats are examples of topics to be discussed.



Conventions

Before you start using QlikView, it is important to understand the terms and notational conventions used in the *Tutorial*. In this section some of the terms will be explained.

General conventions

- The word "choose" is used for carrying out a menu command or a command button in the tool bar or in a dialog.
- The word "select" is used for highlighting an object in a list or on a sheet that you want your next action to affect. It is also used for highlighting field values, thereby making logical selections within the data.
- Numbered lists (e.g. 1, 2, 3, ...) indicate procedures with two or more sequential steps.
- Bulleted lists, such as this one, provide information, and do not indicate procedural steps.

Mouse conventions

- QlikView assumes that you have configured the left mouse button as the primary mouse button and the right mouse button as the secondary mouse button. (This is default in Windows.)
- "Point at..." means move the mouse and thus the cursor until the tip of the cursor points at the referred object.
- "Click..." means point at the referred object, then press and immediately release the mouse button without moving the mouse.
- "Double-click..." means click the left mouse button twice in rapid succession.
- "Right-click" means click with the right mouse button.

Keyboard conventions

- Key names appear in small capital letters, e.g. "Press ENTER".
- The RETURN key and the ENTER key perform the same action in QlikView.
- A plus sign "+" used between two key names indicates that you must press both keys at the same time. E.g., CTRL+S means that you should hold down the CTRL-key, then press the S key while still holding down CTRL.
- A comma sign "," used between two key names indicates that you must press the keys sequentially.

Regional settings

Please note that your computer's regional settings might affect your work in QlikView. For example, the default date and number formats differ between Swedish and English, which might affect calculations if you run English QlikView on a computer with Swedish regional settings. In order to get the best possible results, run this tutorial on a computer with the same language settings as the QlikView application.

Basics

Starting QlikView

You find QlikView on the **Start** menu, under **Programs**.



It is also possible to start QlikView by double-clicking the icon of a QlikView file. After QlikView has started, the file will be opened.

The Start Page

The start page contains several tabs. Only two of the tabs are mentioned here but there are many other useful tabs and functions. For more information about the start page, please consult the **Reference Manual** or the **online help**.

Getting started

Contains information and links that can help you explore the wealth of possibilities in QlikView. This includes direct links to download this Tutorial, links to selected demo examples, a link to the QlikView demo example folder on your local computer and links to selected resources at www.qlik-tech.com.

Recently Opened Documents

The list on this page shows your recently opened documents. Just click a document or web page in this list to re-open it.

If you don't want the start page to appear when you start the program, deselect the **Show Start Page When Launching QlikView** check box at the bottom of the start page. If you close the start page, it can be reopened at any time by choosing **Show Start Page** from the **Help** menu.

Opening an existing file

Use the **Open** command on the **File** menu or the **Open** button on the toolbar to open an existing file. If the file was one of the latest QlikView documents used, you can also open it by choosing the file name from the **Start Page** or the **File** menu.



Several files can be open simultaneously. If this is the case, you can activate another file by choosing it from the list on the **Window** menu, or by using the key combination CTRL+TAB.

Saving a document

Use the **Save** command on the **File** menu or the **Save** button on the toolbar to save an open document. When developing applications, you should save periodically so that you do not lose your work in the event of hardware or software problems or a power failure.



There are two save commands on the **File** menu: **Save** and **Save As**. Use the **Save As** command to save your document under a new file name.

Note It is usually a good idea to save the document before making any major changes or a lengthy operation.

Closing a document

Each document appears in its own window. You can close a document at any time by using the **Close** command in the **File** menu. If you have made any changes, QlikView will display a message asking whether you want to save the changes or not. Selections are considered as changes. Choose the **Yes** button to save, the **No** button to close the document without saving, or the **Cancel** button to cancel the closing procedure.

QlikView Help

QlikView Help is a conventional Help program. To find out how to use the Help program, choose **Using Help** from the **Help** menu. For specific help on QlikView, choose **Contents** from the **Help** menu. On the **Search** page you can perform text searches for topics containing the information that you are looking for..



Context sensitive help can be obtained by pressing the F1 key or by pressing the **Context help** button in the toolbar..



Using Documents on a QlikView Server

All variants of QlikView can be used to access documents on a QlikView Server. This is done via the **Open in Server** command on the **File** menu, or from the **Open in**

Server tab on the **Start page**. However, since we cannot assume that you have access to any QlikView Server, this tutorial deals only with the use of local documents.



WORKING WITH QLIKVIEW

- **Making selections in QlikView**
- **Working with sheets and sheet objects**
- **Creating sheets and sheet objects**
- **Exporting and printing data**



Introduction

This part of the *Tutorial* will show you how to work with an existing QlikView document. Once familiar with the basic terminology, you'll learn how to make selections in QlikView. Subsequently, the components of the QlikView document will be described one by one: you'll learn how to modify and work with the different sheet objects to get the results you are looking for.

Where to find the Tutorial files

To go through the steps in this *Tutorial*, you need the folder *Tutorial* which has been installed together with the program. By default the folder is installed under C:\Program Files\QlikView\Tutorial. It has a subfolder named *Working with QlikView*, which contains two QlikView files: *Tutorial.qvw* and *TutorialFinal.qvw*. You can also download the latest Tutorial files from the Internet, see “About the Tutorial” on page 15.

Checking your results

Tutorial.qvw is the file you'll work with. If you follow all the steps correctly, your final document will look like *TutorialFinal.qvw*.



LESSON 1 MAKING QUERIES IN QLIKVIEW

In this lesson you'll get an overview of the basic components of a QlikView document and learn how to make queries in QlikView.

Opening the document

- 1 Start QlikView by double-clicking the QlikView icon (for other ways of starting the program see page 19).
- 2 Choose **Open** from the **File** menu.
- 3 Select the file *Tutorial.qvw* under *C:\Program Files\QlikView\Tutorial\Working with QlikView*, or where your program files are normally installed, then click **Open**.



You have now opened a QlikView document. First of all, familiarize yourself with the QlikView terminology by taking a look at “An example of a QlikView document” on page 28.

At the top of the screen you have the QlikView *menu bar*; below this, a *toolbar*. One or more *tabs* are shown under the toolbar. Each tab is attached to a *sheet*.

On each sheet there is a number of *sheet objects*. The most basic sheet object is the *list box*. Each list box represents a column (field) of the loaded database table, and contains a number of (*field*) *values*. *Statistics boxes*, *charts*, *multi boxes* and *table boxes* are sheet objects that can be created to get a better overview of data. *Buttons* are used for performing certain commands.

Basic QlikView terminology

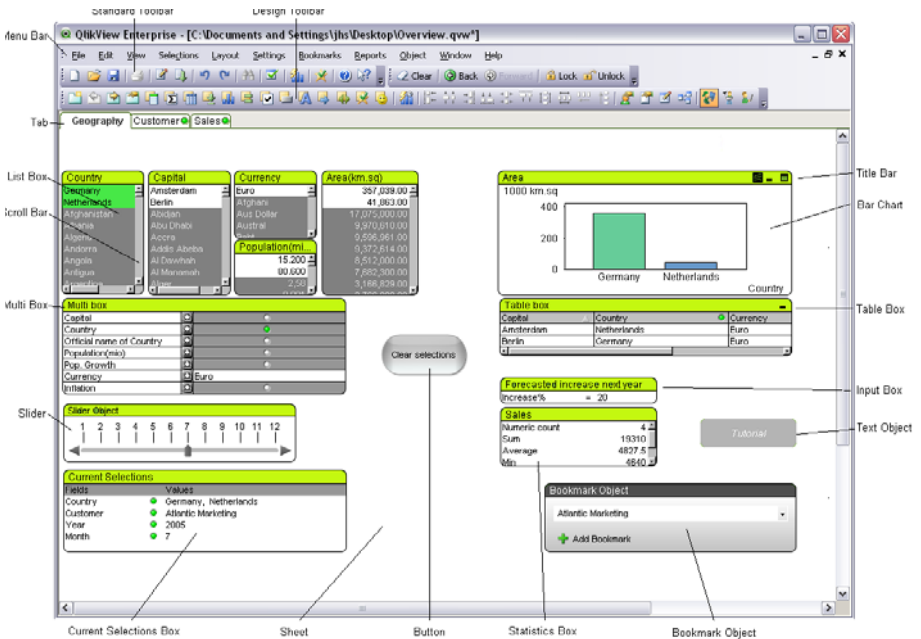


Figure 1. An example of a QlikView document

Selections

In QlikView, the main way of making queries is through the selection of field values. When you make a selection, the program instantaneously shows all the field values in the document that are related to the selected field value.

To make a query, or a search, in the database, you just click on something you want to know more about.

1 Click on the tab *Geography*. The *Geography* sheet opens.

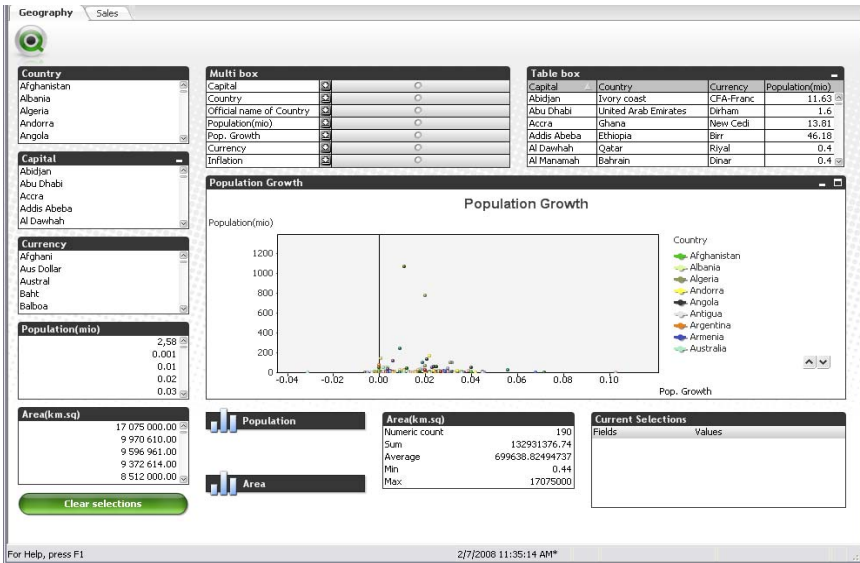
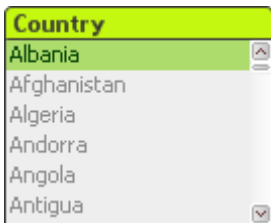


Figure 2. The *Geography* sheet

2 In the list box *Country*, place the mouse cursor on the value *Albania* and click.

The color of the cell turns green. In QlikView terms, the value is *selected*. This means that this is the item of which you want to know more. The result of the search is displayed instantaneously in all the other sheet objects. You immediately see which of the values in the other list boxes are compatible with the selection and which are not.



A value that is compatible with the selection is called *optional*. The cells of optional field values are white.

Selected and optional values are referred to as *possible* values in this Tutorial.

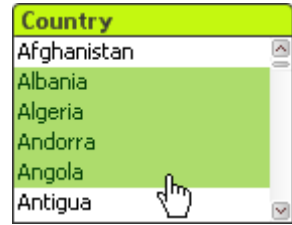
A cell whose contents are incompatible (whose value does not occur in combination with that of the selected item) is called *excluded*. The cells of excluded values are gray.

gray.

To facilitate the overview of the query result, the contents of the list boxes have been sorted, not only alphabetically, but also by their state: optional values are put at the beginning of the list, excluded values at the end.

3 To undo your selection, simply click on the selected cell again, or click on another cell in the same list box. The new selection will replace your previous selection.

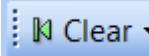
4 To select more than one item in the same list box, hold the CTRL key down while selecting additional values. If the items you are selecting are adjacent to your first selection, you can instead hold the left mouse button down while dragging the mouse cursor.



After this multiple selection within a field, QlikView shows the combinations belonging to any of the field values (logical **or**) as optional values.

Combining selections

An optional value in another list box can be selected in combination with a previously selected value. When you select an optional value from a list box and then select another optional value from another list box, QlikView will show the combinations belonging to both selections (logical **and**) as options.

- 1 Clear your selections by clicking the **Clear** button in the toolbar. 
- 2 Click on the tab *Sales*.
- 3 Suppose you want to know which salesman has sold products to *Captain Cook's Surfing School* in Monaco. Go to the list box *Customer* and search for the value *Captain Cook's Surfing School*.
- 4 Select the value by clicking it.
- 5 Seven values in the list box *Country* are white, i.e. compatible with the selection. Select *Monaco*.

You now see that Joe Cheng is the salesman you are looking for. The value *Joe Cheng* is the only one compatible with both *Captain Cook's Surfing School* and *Monaco*.

By making consecutive selections this way, it is thus possible to step by step get closer to the answer you are looking for.

Keeping track of your selections

When you make many selections at the same time it can sometimes be hard to keep track of them. In order to help you with this QlikView has two good tools, the Current Selections box and the Current Selections window.

On the *Geography* sheet you will find a Current Selections box. This sheet object lists all fields in which selections have been made and the values

selected. If too many values are selected, only the number of selected values is shown


- 1 Make some additional selections in the list boxes and watch how they are reflected in the Current Selections box.

Current Selections	
Fields	Values
Country	● Monaco
Customer	● Captain Cook's Surfing School

Not all QlikView documents have Current Selections boxes on all sheets. If you want to keep track of your selections anyway, you can use the Current Selections window.

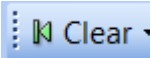
- 2 Click the **Current Selections** button in the toolbar. 

A new window will now appear on top of the QlikView window. This window resembles the Current Selections box quite a bit, but can be moved around as you please and will stay in place even if you go to a different sheet or start working with another document.

- 3 Make some selections and watch how they are reflected in the Current Selections window.
- 4 Close the Current Selections window by once again clicking the Current Selections button in the toolbar. 

Moving selections

The current selections in an active list box can be moved by means of keyboard keys:

- 1 Clear your selections by clicking the **Clear** button in the toolbar. 
- 2 Still on the *Geography* sheet, select the value *Afghanistan*. The values related to this value are now shown in the other list boxes.
- 3 Use the ↓ key of your keyboard to move the current selection one step downwards in the list box. Note that the other sheet objects are updated to show the result of the new selection.

To move the selection upwards, use the ↑ key. Pressing an arrow key when no selection is made is equivalent to scrolling the active list box.

Text searches and numeric searches

Text searches

Another way to search in data is a text search. This is usually the best way to search in long lists. Suppose you are looking for the value *Sweden*.

- 1 Clear your selections by choosing **Clear** from the **Selections** menu.
- 2 Click on the title bar of the list box *Country* (on the *Geography* sheet) to make it active. Active sheet objects have a green title bar in this document.
- 3 Type the letters "sw". Now the list box contains only countries containing the letters "sw". The search string appears in a separate window, between two wildcards representing zero or more characters.



Instead of just starting to type you may also choose **Search** from the **Edit** menu or click the **Search** icon in the toolbar.

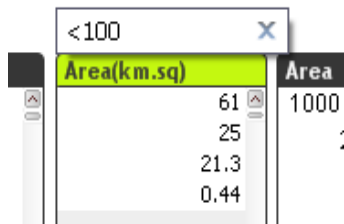


Hitting the ENTER key will select all the countries with names containing "sw". It is also possible to click on the country you wish to select.

Numeric searches

Similarly, if the search is made in a field containing numeric data, you can start your search string with greater than ">" or less than "<" and then enter a number. Suppose you want to select all countries with an area below 100 sq.km.:

- 1 Clear your selections by clicking the **Clear** button in the toolbar.
- 2 Click on the title bar of the list box *Area(km.sq)*.
- 3 Type <100. The string appears in a separate window.
- 4 Only numbers below 100 are now optional in the list box. Press ENTER to select them.



The sheet objects are updated to reflect the result of the selection.

Stepping back or forward in the list of selections

QlikView remembers the last 100 selections. By clicking the **Back** button in the toolbar, you go back to your previous selection:

1 Click the **Back** button in the toolbar. Note that your previous selection is displayed.



2 Click **Back** again to go back another step.

To move forward in the list of selections, do the following:

3 Click the **Forward** button in the toolbar and study the result.



This way, you can go back and forth in the list of selections as you wish. Note that the **Back** and **Forward** buttons only apply to selections; other changes, like the removal of an object or the change of a setting, are not affected.

Locking and unlocking selections

The logic of QlikView by default replaces a previous selection with the new selection if the previous selection is in conflict with the new selection.

1 Select an excluded (gray) value. Note that your old selection disappears.

To prevent this, selections may be *locked*. Locked cells are blue. A selection in conflict with a locked selection will not be performed.

2 Choose **Lock** from the **Selections** menu or from the toolbar. This will lock all selections, preventing them from being cleared by mistake.



3 Try to select an excluded value in another list box and note that it is not possible.

4 To unlock all selections, choose **Unlock** from the **Selections** menu or from the toolbar.



It is also possible to lock fields individually:

5 Select *Albania* in the list box *Country*.

6 Click with the right mouse button on the list box *Country*, then choose the **Lock** command from the float menu. This will lock the selected field values of this specific field. Because the field *Albania* also exist in the multi box called *Multi Box*, it is also locked there.

If there are no selected items in the list, the **Lock** command in the float menu is inactive (dimmed).

-
- To unlock the selection in one field, choose **Unlock** from the float menu (or the **Object** menu) of the list box containing it.

Selection bookmarks

It is possible to save a set of selections for later use:

- Select one or several values, then choose **Add Bookmark** from the **Bookmarks** menu.



The default name for the created bookmark is that of the current date (displayed in the **Create Bookmark** dialog, see the picture). In addition, the first bookmark created on a specific day gets number 1, the second number 2, etc. However, you can change the default name to a more explanatory text:

- Type an appropriate bookmark name in the dialog, then click **OK**.
- Go to the **Bookmarks** menu again and note that your bookmark has appeared in the list of created bookmarks.

The screenshot shows the 'Add Bookmark' dialog box. The 'Bookmark Name' field contains '7/5/10 - 1'. The 'Make this bookmark a document bookmark' checkbox is checked. The 'Include Selections in Bookmark' checkbox is also checked. The 'Info Text' field is empty. The 'Pop-up Message' checkbox is unchecked. The 'OK', 'Cancel', and 'Help' buttons are visible at the bottom.

To show the saved set of selections again, simply select the bookmark in the list.

A maximum of ten bookmarks can be displayed in the list. To see further bookmarks, to get more details on a specific bookmark or to delete a bookmark, choose **More** from the **Bookmarks** menu.

Bookmarks can also be created and selected via a bookmark object in the layout. More about this in the *Reference Manual*.

Now that you've learned how to make selections in QlikView, it is time to describe the components of the document more thoroughly. The most basic component is the sheet, which will be introduced in the next lesson.

Saving your work

If you don't want to turn to the next lesson right away, you can close the document. You should also save the document, since the following lessons are based on the work you've done so far.

- 1 Choose **Save As** from the **File** menu to save a copy of the document.
- 2 Type *MyTutorial.qvw* or something similar in the **File name** box, then click **Save**.

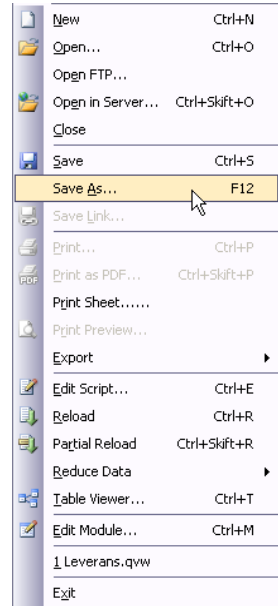
QlikView saves the copy. *MyTutorial.qvw* now contains all the changes you've made since you opened the document, whereas the original document (*Tutorial.qvw*) remains unchanged.

You can now close the file:

- 3 Choose **Close** from the **File** menu.

If you won't be working with QlikView for a while, you can also exit the program:

- 4 Choose **Exit** from the **File** menu.



Checking your work

The folder *Working with QlikView* contains not only the file *Tutorial.qvw* that you've been working with, but also a file called *TutorialFinal*. If you want to, you can open this file to compare it with the one you just saved.



LESSON 2 HANDLING SHEETS AND SHEET OBJECTS

This lesson introduces the sheet, which is the most basic component of the QlikView document. You'll learn how to create a sheet, how to add sheet objects to it, and how to move it. The lesson ends with an overview of the available sheet objects.

Opening the document

If you closed the document and exited QlikView after the previous lesson, you need to open it again.

- 1 Start QlikView by double-clicking the QlikView icon (for other ways of starting the program see page 19).
- 2 Open the file *MyTutorial.qvw*. If you used the file recently you can open it directly from the **Recently Opened Documents** tab on the **Start Page**. The **Start Page** can be opened at any time under **Help - Show Start Page**.

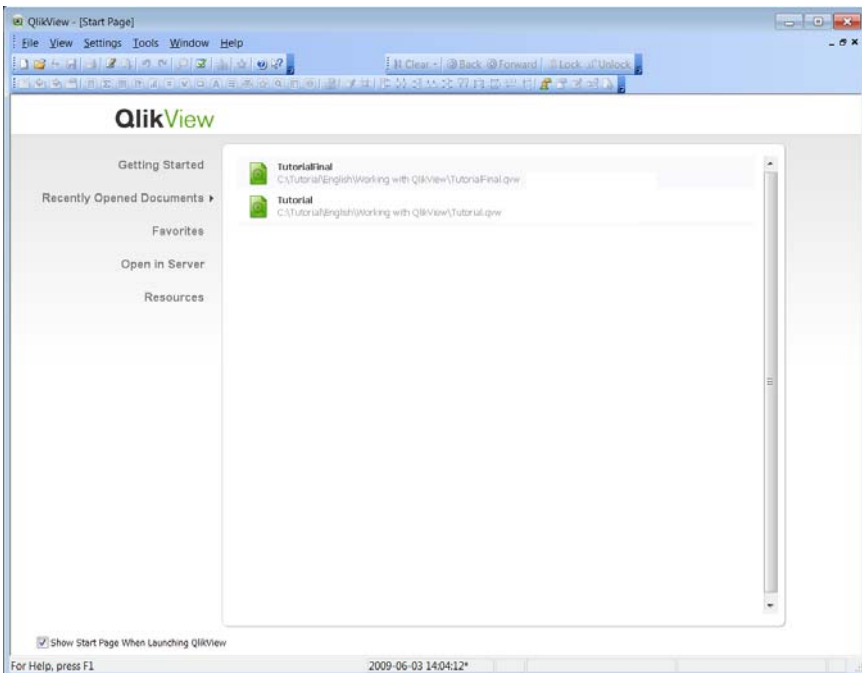


Figure 3. The start page in QlikView

Presentation

Holding all the different objects, the sheet can be considered the most basic component in QlikView. A document usually contains several sheets, which is useful when one wants to achieve a more structured layout. Any sheet object can be put on any sheet. The sheets will, however, still be logically connected, i.e. a selection made on one sheet will affect all sheet objects on all other sheets

Logical connections between sheets

Each sheet has a tab attached to it. Containing the name of the sheet, the tab helps you find the sheet you are looking for. By clicking on a tab, you activate the sheet attached to it. You recognize an active tab from the bold text.

There are two sheets in your document: *Geography* and *Sales*. *Geography* is the active sheet.

1 Click on the tab *Sales*.

The tab name changes from normal to bold, and the sheet attached to it is shown.

2 Select the value *Albania* in the list box *Country*.

The cell of the selected value turns green and you immediately see all the values of all other fields that are compatible with the selection (white). You see that the fictive company has one customer in Albania, Moe's Laundromat, and that John Lemon is responsible for the sales.

The sheets are logically connected, i.e. a selection made on one sheet will affect all sheet objects on all other sheets.

3 Go to the sheet *Geography* by clicking on its tab.

The sheet *Geography*, on which you learn more about the geographical data related to the value *Albania*, also contains a *Country* list box. Note that the value *Albania* is selected (green) in this list box too, although you made your selection on the sheet *Sales*.

Note the green dot on the tab *Sales*. This is a selection indicator, helping the user to keep track of selections made on other sheets. Especially in large documents containing many selections, this kind of reference to sheets where the selections can be changed is indispensable.

If referring to a locked selection, the selection indicator is blue.



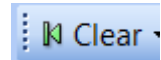
- 4 Go back to the sheet *Sales*.
- 5 Select the item *Cezar Sandu* (currently excluded, i.e. gray) in the list box *Salesman*.

You immediately see that Cezar Sandu has been active in France, Germany, and Mongolia. The item *Albania*, which is not compatible with the selected item *Cezar Sandu*, has been excluded.

- 6 Go back to the sheet *Geography*.

The data displayed in the sheet objects has been updated to show the result of the new selection: *France*, *Germany* and *Mongolia*, as well as the items related to these countries, are shown as optional (white).

Clear all selections by clicking the **Clear** button in the toolbar



Adding a sheet.

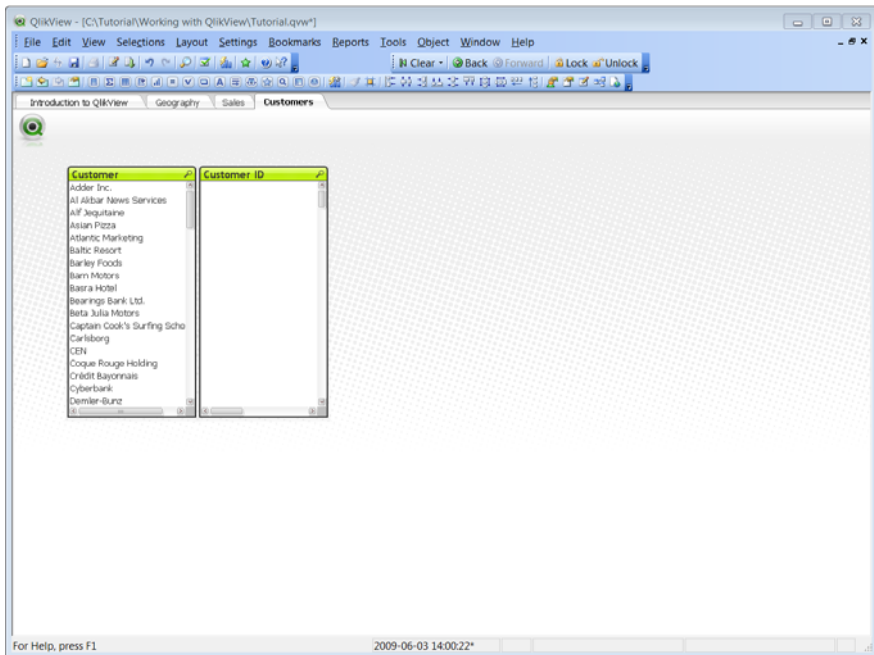


Figure 4. The new sheet.

- 1 Choose **Add Sheet** from the **Layout** menu. A new sheet appears. .



- 2 Click somewhere on the empty sheet with the right mouse button and choose **Properties** from the menu that appears. The **Sheet Properties** dialog will now appear.

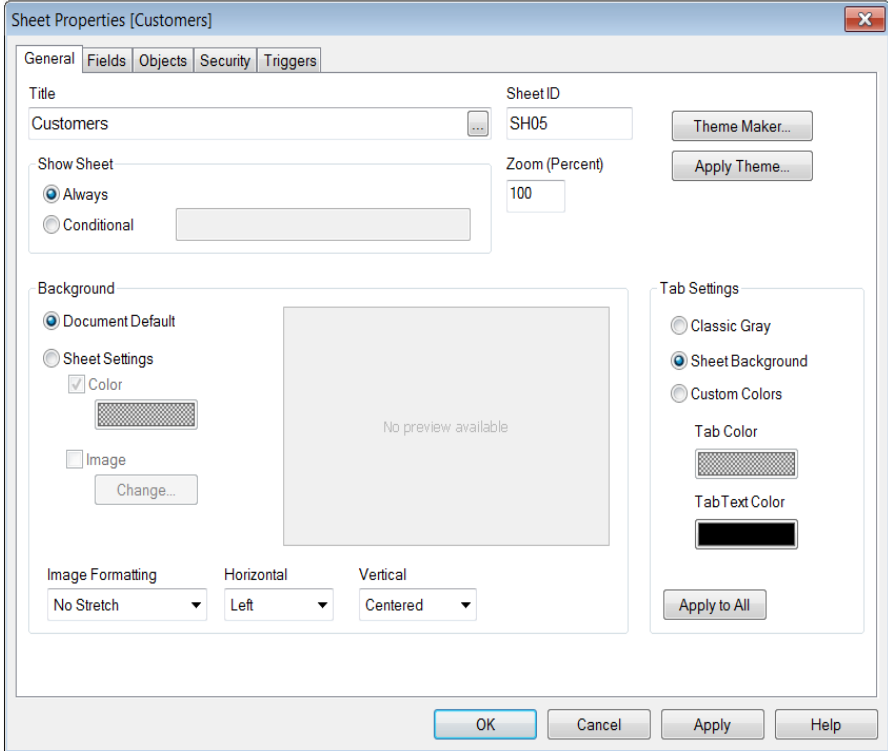


Figure 5. The Sheet Properties dialog

- 3 On the **General** page, change the title from *Sheet2* to *Customers*.
- 4 Still in the **Sheet Properties** dialog, click the **Fields** tab.
- 5 This dialog page contains a list of available fields. Select *Customer*, then click the **Add >** button. The field has now been moved to the column of displayed fields, which means that it will appear as a list box on your sheet.
- 6 You can also double-click fields in the left column to move them to the right (**Fields Displayed in Listboxes**). Double-click the field name *Customer ID*.
- 7 Click **OK** to close the dialog.

You have now created a new sheet containing two list boxes. Instead of creating a new sheet, it is also possible to right-click an existing sheet and choose **Copy Sheet**. When copying a sheet, all sheet objects on that sheet are copied at the same time.

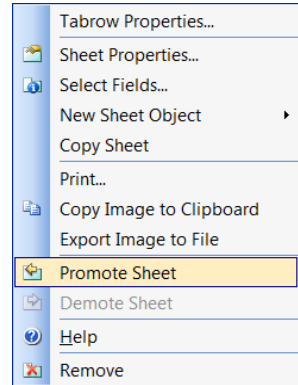
The list boxes are not placed where you want them. You will fix this soon (under “Selecting and moving several sheet objects simultaneously” on page 43).

Moving a sheet

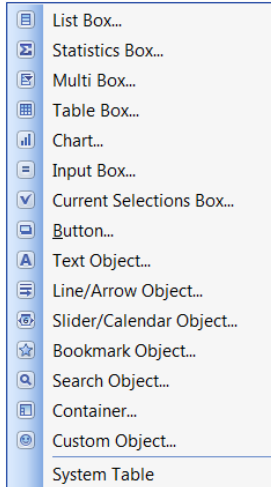
Your new sheet *Customers*, containing the list boxes *Customer* and *Customer ID*, is placed to the right of the sheet *Sales*. Suppose you want it in the middle:

- 1 Click on the tab of your newly created sheet with the right mouse button. From the float menu that opens, choose **Promote Sheet**.

The new sheet has now been placed between the sheets *Geography* and *Sales*.



Adding new sheet objects



If you right-click somewhere on the sheet *Customers*, then select **New Sheet Object**, you see this list of all the sheet objects that can be used in QlikView..

All the sheet objects except buttons, text objects and line/arrow objects can be used for making selections in the data. All sheet objects may be used for viewing the result of selections.

The *Customers* sheet created in the previous lesson contains two list boxes, *Customer* and *Customer ID*. Suppose you want to add a third sheet object: a list box containing countries.

1 Make sure that the sheet *Customers* is active, then right-click somewhere on the sheet. Select **New Sheet Object**, then **List Box**. The dialog **New List Box** opens.

2 On the **General** page of the **New List Box** dialog, select *Country* from the drop-down list **Field**. *Country* will automatically become the title of the new list box. If you like, you can change the title on the same page under **Title**.

3 Click **OK**.

The field *Country* now appears as a list box on your sheet *Customers*.

In the following lessons, the most important sheet objects, including list boxes, will be introduced one by one. but first of all you need to learn how to present and position sheet objects on the sheet.

Moving a sheet object

To move a sheet object you select it with the mouse button, then keep the mouse button depressed while dragging it.

1 On the sheet *Customers*, align all sheet objects vertically on the left hand side of the sheet.

To move a sheet object step by step, use CTRL+arrow. For bigger steps, use CTRL+SHIFT+arrow.

Undo Layout Change

Undo layout Change is a very useful function that you can use to undo your latest layout change, including moving, sizing and removing sheet objects as well as changes to document, sheet and sheet object properties.



QlikView maintains a list of the latest layout changes. Each **Undo Layout Change** command will take you backwards one step in the list. You will use this command in an exercise later on.

You can also use the Windows command CTRL+Z to undo your changes.

1 Undo your latest layout change. The list box moves back up next to the other list boxes.

Selecting and moving several sheet objects simultaneously

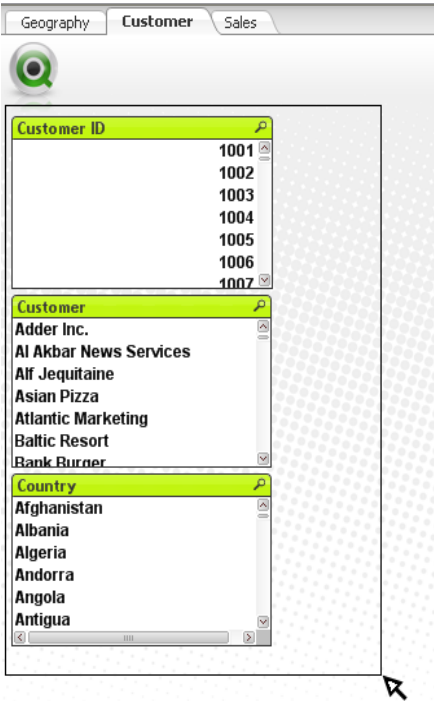


Figure 6. Activating several sheet objects

To move several sheet objects at the same time, start by selecting them. This is done in the following way:

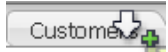
- 1 On the sheet *Customers*, place the mouse cursor in the top left corner, then press it and drag a rectangle enclosing all the list boxes that you want to move. Note that the title bars of the enclosed list boxes turn green after you let go of the mouse button. This means that they are selected, i.e. active.
- 2 Place the mouse cursor on the title bar of one of the list boxes, then press the mouse button and drag. All the selected list boxes are moved. If the list boxes are not perfectly aligned, don't worry - you will fix this in a moment.

It is also possible to select several sheet objects by SHIFT-clicking their title bars.

Copying sheet objects

To copy a sheet object on the same sheet, press the CTRL key and keep it depressed while placing the cursor on the title bar of the object that you want to copy. Drag the cursor to the place where you want to put the copy of the sheet object. You can either copy sheet objects to another place on the same sheet, or to another sheet.

In case you want to add a sheet object that is found on another sheet, you can simply copy it. The list box *Country*, e.g., is found on the sheet *Geography*:

- 1 Click on the tab of the sheet *Geography* to make it active.
- 2 Press the CTRL key and keep it depressed while placing the cursor on the title bar of the list box *Country*.
- 3 Press the mouse button and drag the list box to the tab *Customers*. While dragging, make sure that a small plus sign appears; if it does not, this means that you have released the CTRL key.
- 4 When the cursor turns into a rounded arrow on the tab *Customers*, release the mouse button, then the CTRL key. 
- 5 Go to the sheet *Customer* to make sure that the list box *Country* has appeared. Its position on the sheet is now the same as on the sheet from which it was copied. Move it to the right of the other *Country* list box.

If you prefer the standard Windows **Copy** and **Paste** commands, they can be used as well. You find them in the **Edit** menu. The standard Windows shortcuts CTRL+C and CTRL+V also work.

Sizing a sheet object

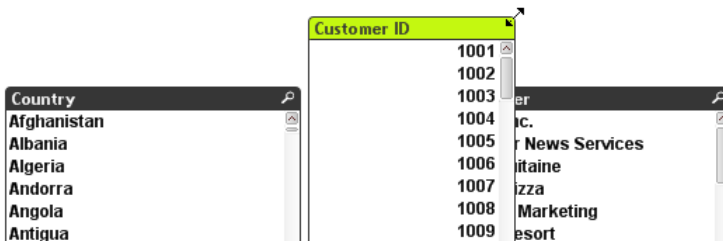




Figure 7. Sizing a sheet object

You can size list boxes (and other sheet objects) by dragging the window frame of the object.

- 1 Click on the title bar of the list box *Customer ID* (on the sheet *Customers*) to make it the only active list box. If other list boxes are active, they will be sized as well.
 - 2 Move the pointer to one of the corners of the list box until the appearance of the pointer changes.
 - 3 Press the mouse button and drag as shown in Figure 7 on page 44.
- The list box *Customer ID* now overlaps the list box next to it. You'll deal with this in the next section.

Aligning and distributing sheet objects on the sheet

There are several commands that help you tidy up the layout of your sheets by aligning and spacing your sheet objects.

- 1 Select all list boxes on the *Customers* sheet. If you have forgotten how to do this, see “Selecting and moving several sheet objects simultaneously” on page 43. You can tell from the green title bars which list boxes are selected (active).
- 2 As you are going to align the list boxes vertically, you may want to make them a little smaller. While several list boxes are active (selected) at the same time, you can size them all at once by dragging one of the window frames. See “Sizing a sheet object” on page 44.
- 3 In the **Layout** menu, place the mouse cursor on the **Align/Distribute** command. The cascade menu that opens contains several commands. Choose **Adjust Top**. 
- 4 The list boxes are now evenly spaced horizontally, but you also want them to be aligned to the left. Select all listboxes again if necessary, then choose **Align Left**. 
- 5 While the list boxes are still active (green), move them down a little on the sheet.

Note Feel free to experiment with the layout. You can always use **Undo Layout Change** or CTRL+Z (Windows standard) to undo your layout changes.

Displaying and using the design toolbar



Figure 8. The design toolbar

If you use a QlikView document only for making selections, the standard and navigation toolbars are sufficient: they contain the most common commands for working with a document.

However, as soon as you modify the layout, add objects etc., the design toolbar may be helpful. The design toolbar contains commands for adding sheet objects, moving sheets, and adjusting the layout.


- 1 Select **View - Toolbars - Design** to show the design toolbar.

Here you find the **Align Left** command that you used before. You used a corresponding menu command when aligning sheet objects. See “Aligning and distributing sheet objects on the sheet” on page 45.



Minimizing and restoring a sheet object

List boxes and other sheet objects can be minimized if, for some reason, you don’t want them on the screen now but might need them again later.

Note the  symbol in the upper right corner of the chart and the table box on your *Geography* sheet. This symbol indicates that the sheet object can be minimized. To make a list box minimizable, do the following:

- 1 Click on the list box *Capital* with the right mouse button and choose **Properties...** from the float menu.
- 2 Go to the **Caption** page and mark the check box **Allow Minimize**, then click **OK**.



The minimize symbol appears in the top right corner of the list box.

- 3 Click the symbol or double-click on the title bar of the list box.

The list box turns into an icon, which is placed where there is space on the sheet. The icon can be moved freely.



- 4 Restore the list box by double-clicking the icon.

You can also minimize a list box by right-clicking it and choosing **Minimize** from the float menu, and restore it by choosing **Restore** from the menu.

Auto Minimize

Auto Minimize is a useful function where only one of the charts on a certain sheet will have its full size at any given time. The others

are minimized in order to save space on the sheet. The charts *Area* and *Population* on the *Geography* sheet have been preset to **Auto Minimize**.

Container Object

The container object is another useful tool for showing several object types in a limited space. Read more about the container object in the QlikView Reference Manual and Help.

Removing a sheet object

If you have followed all the steps above, there are two *Country* list boxes on your sheet *Customers*. You only need one:

- 1 Click on one of the *Country* list boxes of the sheet *Customers* with the right mouse button.
- 2 From the float menu that appears, choose **Remove**.
- 3 Confirm that you are sure about removing the list box by clicking **OK**.

The list box disappears from the screen.

Another possibility is to choose the **Remove** command from the **Object** menu. The **Object** menu is equivalent to the float menu of the active sheet object (the one whose title bar is green). If no sheet object is active, the **Object** menu belongs to the active sheet. If several sheet objects are active, the **Object** menu contains the commands that are common to the active objects.

A further possibility for removing a sheet object is by selecting it and pressing the DELETE key.

Changing the border of a sheet object

Every sheet object has a border that can be given a number of different appearances.

- 1 Click on a list box with the right mouse button, and choose **Properties...**
- 2 Go to the **Layout** page.
- 3 Pick a border format of your choice.
- 4 Click **OK**.

If you want all the sheet objects in the document to have the same border, you should change the setting in the **Document Properties** dialog instead (see page 122).

-
- 5 Undo your layout change, see “Undo Layout Change” on page 42.



Changing the font of a sheet object

Most sheet objects contain text. The text is written in a certain font. To change the font of a single object, open the **Font** page in the **Properties...** dialog of the particular object. To change the font of the entire document, open the **Font** page of the **Document Properties** dialog (see page 122).

Copying layout formats between sheet objects

If you want to copy formats from an existing sheet object to the other sheet objects, you can do this in a click using the **Format Painter**. The statistics box *Area (km.sq)* on the *Geography* sheet does not have the same layout as the other sheet objects. You can easily change that:

- 1 Select a sheet object that has the correct layout, for example the Table box, so that its caption turns green.
- 2 Click the **Format Painter** button on the Design toolbar.
- 3 Click the statistics box *Area (km.sq)*.
- 4 The layout (in this case: border and caption) of the statistics box changes.



You can use the **Format Painter** tool for any sheet object. You can also use it for several sheet objects at one time. Just click on the source object, then double-click on the **Format Painter** button and click on each of the target objects. To end the “painting”, click the **Format Painter** button again or click ESC.

Linked Objects

If you want several objects to have the same layout properties, you can use linked objects. These are objects that share all properties with the exception of size, position and display state (minimized, normal or maximized). When you change the properties of one object the change is immediately reflected in the other linked objects. Linked objects can reside on the same sheet or on different sheets. To create a linked object:

- 1 Right-click a sheet object and select **Copy to Clipboard - Object**.
- 2 Right-click somewhere on the sheet (or on a different sheet) and select **Paste Sheet Object as Link**.

Saving, closing and exiting

If you don't want to turn to the next lesson right away, you can close the document. You should also save the document, since the following lessons are based on the work you've done so far.



LESSON 3 LIST BOXES AND STATISTICS BOXES

In the previous lesson you learned to add, copy, move, size and remove list boxes and other sheet objects. You will now learn to modify a list box and its way of displaying data. The sort order and the number format are examples of properties that you will change. At the end of the lesson, you will also learn how to create and use a statistics box.

Opening the document

- 1 Start QlikView.
- 2 Open the file you worked with in the previous lesson. It should be called something like *MyTutorial.qvw*.

If *MyTutorial.qvw* is among the most recently used files, you can normally open it directly from the **start page**.

The list box

The list box, which is the most basic object on the screen, contains a list of all the values of a specific field (column) in the database.

All the values contained in the database field are shown in the listbox. If there is not enough space to show all values in the visible part of the list box, a scroll bar is displayed on the right.

If a value occurs several times in one and the same field, it will only be displayed once in the list box.

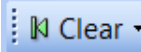
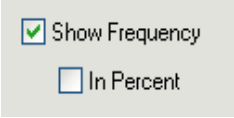


Changing the properties of a list box

Every sheet object has a properties dialog, containing several pages where you can change the object's settings. You will now make some changes to the list box settings, using the pages in the **List Box Properties** dialog.

Showing frequency


Suppose you are interested in knowing how many countries use the currency Rupee.

-
- 1 Clear your selections by clicking the **Clear** button in the toolbar. 
 - 2 Go to the sheet *Geography*.
 - 3 Click on the list box *Currency* with the right mouse button and choose **Properties...** from the float menu.
 - 4 On the **General** page of the **List Box Properties** dialog, select the **Show Frequency** check box by clicking in it. 
 - 5 Choose **OK**.

Any currency that you select in the list box is now followed by its number of occurrences. The currency Rupee is followed by the number 5, meaning that this currency is used in five countries.

Undo Layout Change

Showing frequency for currencies is not really useful in this document.

- 1 Use the **Undo Layout Change** button to undo the change that you made in the previous exercise. 

Changing the number and order of columns

To display the contents of a list box in several columns, do the following:

- 1 Clear your selections.
- 2 Go to the *Sales* tab. Click on the list box *Day* with the right mouse button, then choose **Properties...** from the float menu.
- 3 Go to the **Presentation** page.
- 4 Deselect **Single Column**. Select **Cell Borders**. Click **OK**.
- 5 If necessary, drag the border of the list box *Day* until its contents are displayed in seven columns.

The values are ordered by column, i.e. vertically. You may prefer to have the values of the *Day* list box ordered by row:

- 6 Click on the list box *Day* with the right mouse button, then choose **Properties...** from the float menu.
- 7 Go to the **Presentation** page.
- 8 Deselect **Order by Column**, then click **OK**.

The field values, instead of being ordered by column (vertically), are now ordered by row (horizontally). Your list box should now look like the one to the right. You can change the number of columns by changing the width of the list box. Drag the borders with the mouse pointer.

Day						
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

- Repeat for the *Month* list box so that the months are grouped by quarters.
- Select and move the sheet objects so that everything fits nicely on the sheet again. See “Selecting and moving several sheet objects simultaneously” on page 43. For a picture of a possible sheet layout, see page 114.

Changing the sort order

A number of different sort orders are available for each list box.

Numeric fields are usually sorted by numeric value, whereas fields containing text tend to be sorted in alphabetical order (**Text**).

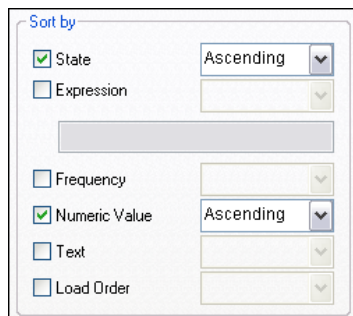
In addition, list boxes whose values are not all visible (list boxes with scroll bars) are set to **Sort by State**, which means that the values are sorted according to their logical state (selected, optional, excluded). This way, selected and optional values are always visible in the document.

- On the **Sales** sheet, click on the list box *Sales* with the right mouse button, and choose **Properties...**
- Go to the **Sort** page.

The list box *Sales*, as we see, is sorted by **State** and **Numeric value, Ascending**. The order of the sort options in the list corresponds to the priority sort order.

Thus, as long as no selection is made, the values in the list box *Sales* are sorted by numeric value; as soon as a selection is made, however, the state of the values determines the sort order.

- Keep the option **Numeric value** selected, but change the order to *Descending* by choosing it from the drop-down box (click the arrow to the right).
- Click **OK**.



The highest number is now at the top. As soon as a selection is made, however, the selected (green) value(s) or optional (white) values will be placed at the top.

- 5 Make a selection in the list box and study the result.
- 6 Clear your selections.

Changing the number format

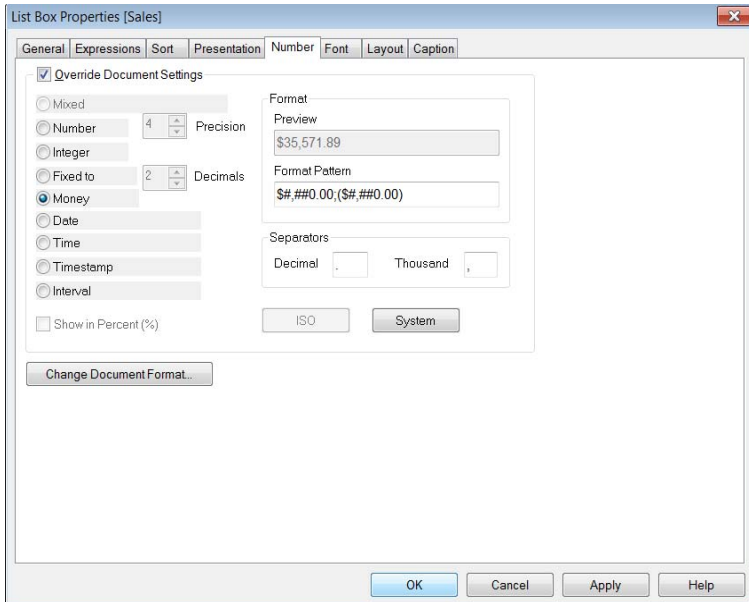


Figure 9. The dialog page on which the number format is set

Numeric data can be of different types and can be formatted in different ways.

- 1 Click on the *Sales* list box with the right mouse button, and choose **Properties...**
- 2 Go to the **Number** page.

The number format of the field *Sales* is disabled because all number formats are inherited from the document's default settings. Furthermore, the default settings in the document are affected by your computer's regional settings.

To set the number format for the *Sales* list box in US dollars do the following:

- 3 Click in the **Override Document Settings** check box in order to create a separate number format for this list box.
- 4 Select the option **Money**, then click **OK**.

Note that the values in the list box *Sales* (see Figure 9) are now differently formatted (you may need to size it first): a comma has appeared as thousands separator and the values are preceded by a \$. Two decimals have been added.

- 5 Open the **Properties** dialog again.
- 6 Study the **Number** dialog page. The current format is displayed in the **Format** box, and below this a preview is given. The format can be changed manually. Erase the two decimals (the zeros) and view the result of the change in the **Preview** box.

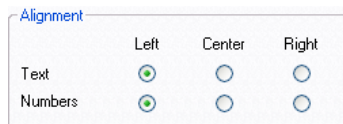
If you cannot erase the zeros, or have different number formats by default, this could be caused by your computer's regional settings.

- 7 Click **OK** to close the dialog.

Aligning the values

Text is usually left-aligned, numbers right-aligned. This setting can be changed on the **Presentation** page.

- 1 Click on the list box *Year* with the right mouse button, then choose **Properties...** from the float menu.
- 2 Go to the **Presentation** page.
- 3 In the **Alignment** group, click **Left** for numbers.
- 4 Click **OK**.



The statistics box

The statistics box is a compact way of showing a numeric field in which the separate records are not interesting until their sum or average has been calculated.

A number of different statistical functions can be used in a statistics box. It is also possible to make selections in the statistics box by clicking on some of the functions, e.g. *Min*, *Max* etc.

Sales	
Total count	713
Sum	2317233
Average	3,249.98
Min	690
Max	6990

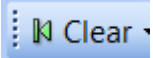
The sheet *Geography* in your document contains a statistics box based on the field *Area(km.sq)*.

As long as no selections are made in the document, the values shown in the statistics box are calculated using all the possible values of the corresponding list box. As soon as you click a value, however, the statistics box is updated just like the other sheet objects.


- 1 Select the items *Albania*, *Algeria*, *Andorra* and *Angola* in the list box *Country* and see how the values in the statistics box change.

Statistics boxes can be moved, sized, copied and closed just like list boxes.

Creating a statistics box

- 1 Make sure that no selection is made by clicking the **Clear** button in the toolbar. 
- 2 Click on the list box *Sales* on the *Sales* sheet with the right mouse button, and choose **Create statistics box** from the float menu.

A statistics box with the same name as the active list box now appears on the screen. You might need to size it to see all the numbers properly:


- 3 Put the cursor inside the right border of the statistics box. When it looks like the picture you can start dragging. 

The statistics box shows too many decimals at the moment. To limit the number of decimals shown for each value:

- 4 Right-click the statistics box to open the **Properties** dialog.
- 5 Go to the **Number** tab. Under **Functions**, select the field **Average** and mark the check box **Override Default Settings**.
- 6 Select the radio button **Fixed to** and select *2 decimals*. Click **OK**.

You immediately see that the fictive company has sold products for a total amount of 2,317,233 USD, that 713 sales have been performed, etc.

You can also create statistics boxes by choosing **New Sheet Object, Statistics Box** from the **New Sheet Object** menu or clicking the **Create Statistics Box** button in the toolbar.

In that case, the **New Statistics box** dialog of the statistics box is opened. This dialog looks similar to that of the list box, but it only contains four pages. On the **General** page, you select the statistical functions you wish to use. 

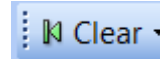
Making selections in a statistics box

You can make selections in a statistics box by clicking on the non calculated functions, e.g. *Min* or *Max*.

- 1 Click the function *Max* to find the customer who made the biggest purchase.

The selection is made in the list box to which the statistical value belongs.

- 2 Clear all selections by clicking the **Clear** button in the toolbar.



The list box and the statistics box are only two of the sheet objects available. In the next three lessons, different kinds of charts and tables - calculated objects allowing you to get an even better overview of your data - will be introduced.

Saving, closing and exiting

If you don't want to turn to the next lesson right away, you can close the document. You should also save the document, since the following lessons are based on the work you've done so far.



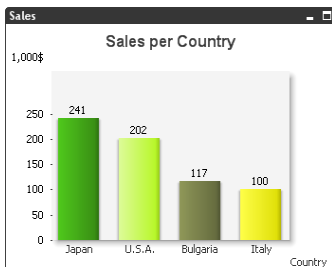
LESSON 4 BAR CHARTS AND PIE CHARTS

Due to the variety of chart subtypes, and considering the great number of available settings, the *Tutorial* provides three lessons on charts. This lesson will start by giving you a general introduction to working with charts; subsequently, you'll create a simple bar chart. Once familiar with the basics, you'll modify the properties of the chart and finally turn it into a pie chart.

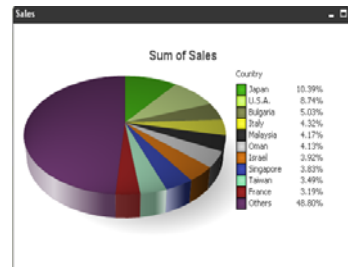
Introduction

Charts and tables are sheet objects that can show numbers very compactly. You can e.g. show sums of money distributed over different fields such as year, month, account number, etc. Numbers that are calculated using several records in the input tables (sums, averages, min, max) can only be shown in charts or statistics boxes.

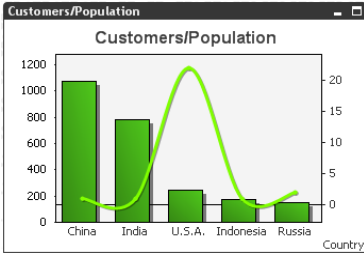
Charts, pivot tables and straight tables are logically the same thing, even though they look different. Hence, we will from here on simply refer to them as charts. Charts can thus be shown as bar charts, pie charts, scatter charts, line charts, combo charts (bar/line), radar charts, grid charts, gauge charts, straight tables, pivot tables or block charts. All the chart types are shown below.



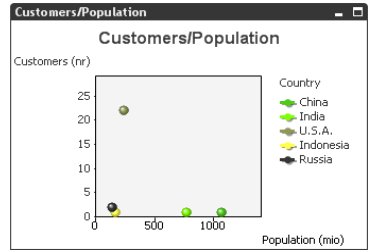
Bar chart



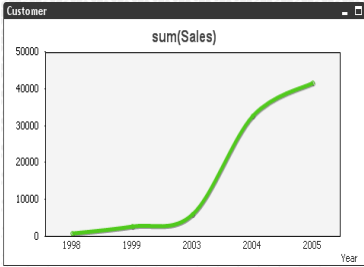
Pie chart



Combo chart



Scatter chart



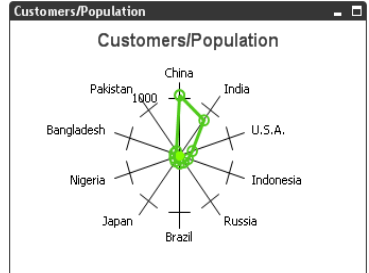
Line chart

Salesman	Year	Country	Sales
			2317233
Ann Lindquist	1998	U.S.A.	3240
Ann Lindquist	2000	Bahrain	1090
Ann Lindquist	2000	Philippines	1270
Ann Lindquist	2001	Philippines	4150
Ann Lindquist	2002	Pakistan	2719
Ann Lindquist	2003	Pakistan	11379
Ann Lindquist	2003	Philippines	3290
Bill Yang	1998	Saudi Arabia	690
Bill Yang	1999	Greece	4720
Bill Yang	1999	Slovenia	859
Bill Yang	2000	Bulgaria	1290
Bill Yang	2000	Greece	900
Bill Yang	2000	Slovenia	1030

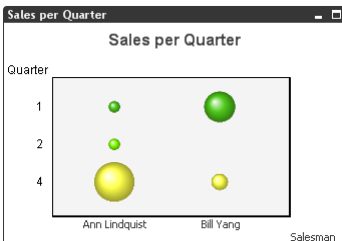
Straight table

Country	Year	Salesman	Sales
Japan			240,781
U.S.A.			202,455
Bulgaria			116,550
Italy	2004		22,316
	2005		22,316
	2000		2,190
	2001		1,640
		Joe Cheng	19,960
	2002	Sehoon Daw	10,880
		Marcus Sa...	1,250
		Joe Cheng	7,748
	2003	Jerry Tessel	4,149
		Keith Hel...	4,040
	Tony Ced...	3,690	

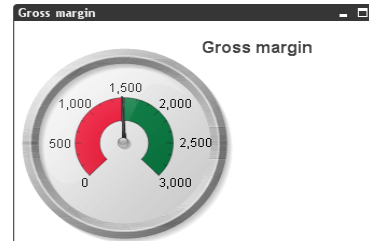
Pivot table



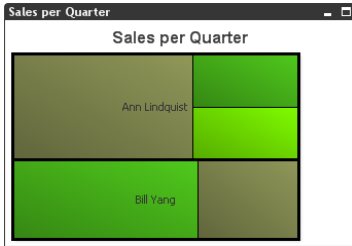
Radar chart



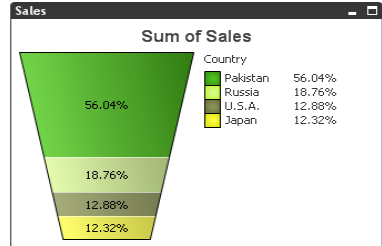
Grid chart



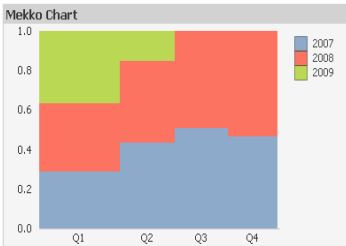
Gauge chart



Block chart



Funnel chart



Mekko chart

Opening the document

- 1 Start QlikView.
- 2 Open the file *MyTutorial.qvw*.

If *MyTutorial.qvw* is among the most recently used files, you can normally open it directly from the **start page**.

Making selections in a chart

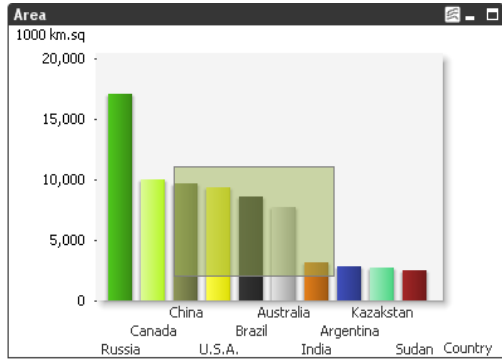
Until now, we have only studied selections in list boxes. It is however also possible to select data in charts. Go back to the bar chart called *Area* on the *Geography* sheet. It shows the world's ten largest countries.

- 1 Place the cursor in the chart, then press the mouse button and select a few bars by "painting" the area (dragging the cursor). When this is done, release the mouse button.

- The countries represented by the bars you painted have been selected. The change is reflected in the list box *Country*.

It is also possible to make selections by clicking on the country names (labels) in the chart:

- Select one or several countries by clicking on their labels.
- Clear your selections.



Changing chart types using a fast type change icon

Some charts in QlikView are prepared for being displayed as more than one type. This is shown as a little icon, either in the chart's title bar or in the chart itself. The icon is a miniature of the next chart type that will appear if you click on it.

- Take a look at the bar chart in the *Geography* sheet. In the title bar next to the minimize icon you will find a fast type change icon.
- Click the icon with the left mouse button. The chart will turn into a line chart.
- This chart has been prepared for changing between three types of charts: bar, line and pie. If you click again the chart will turn into a pie chart.
- Now click with the right mouse button on the fast type change icon. A drop-down menu will appear with the possible chart types. Click the bar chart icon and we are back where we started.

All charts can be turned into any of the chart types available by going through the chart's **Properties** dialog that you reach by right-clicking somewhere in the chart. More about this later.

Creating a bar chart using the Quick Chart Wizard

The toolbars contain two buttons for creating charts. The button called **Quick Chart Wizard**, helps you create some of the most common chart types in a few simple steps. The number of options is limited in the Quick Chart Wizard to start with, but you can add any number of properties once the chart is finished.



The button called **Create Chart**, opens the full chart wizard in which you can set a greater number of properties from the very beginning.



No matter which wizard you choose, you will get a full-blown chart whose settings can be modified at any time. If the toolbars should not be visible, you reach them by selecting **View - Toolbars**.

You'll start by creating a simple chart showing the sum of sales per country.

- 1 Go to the sheet *Sales*, and click the **Quick Chart Wizard** button in the main toolbar. The start page of the **Quick Chart Wizard** opens. Click **Next >**.
- 2 Step 1 of the **Quick Chart Wizard** contains icons representing different chart types. The icon representing the bar chart is preselected. Click **Next >**.



The next page, **Define dimension(s)**, of the QuickChart wizard opens. Here you define the meaning of each bar in the bar chart. In this case each bar corresponds to a *Country*.

- 3 Select the field *Country* in the combo box **First Dimension**. Click **Next**.

On the next page, **Define Expression**, you define what value the height of the bars in the bar chart corresponds to. The answer, in this case, is the *Sum of Sales* for each country.

- 4 Select the option **Sum** to get the sum of sales per country. Select *Sales* from the drop-down box. Click **Next >**.
- 5 On the fourth page you select a **Chart format** by clicking the icons for **Style**, **Orientation** and **Mode**. Keep the preselected settings and mark the checkbox **Show Numbers** in order to show numbers above each bar.
- 6 Click **Finish**. The chart now appears on your screen.

Due to different default settings on different computers, its colors may differ from the pictures in this Tutorial. You can go back and make adjustments at any time using the created chart's properties dialog:

- 7 Right-click the chart and choose **Properties....**

-
- 8 Under the **General** tab, type *Sales 1* in the **Window Title** box and *Sales per Country* in the **Show Title in Chart** box. Make sure that the corresponding check box is marked.
 - 9 Under the **Caption** tab, click **Auto Minimize**. This will be explained in more detail under “Auto Minimize” on page 85.
 - 10 Click **OK**.

The chart’s layout is by no means optimal: among other things, the great number of bars in the chart makes it difficult to get an overview. You’ll soon be able to change this. However, you can already use the chart to make selections or to view the result of selections:

- 11 Select *Ann Lindquist* in the list box *Salesman*.

The chart immediately displays the countries to which Ann Lindquist has sold products, as well as the amounts of money involved.

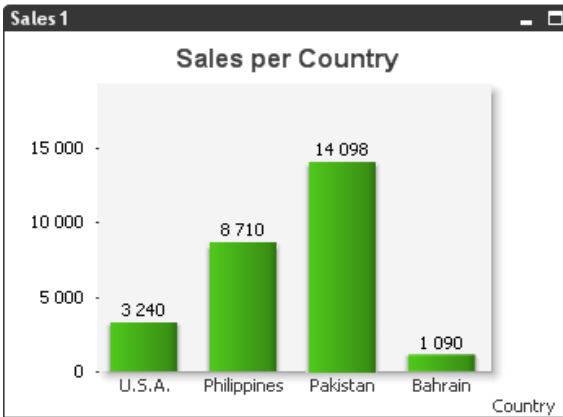


Figure 10. The countries to which Ann Lindquist has sold products.

Creating a bar chart using the full chart wizard

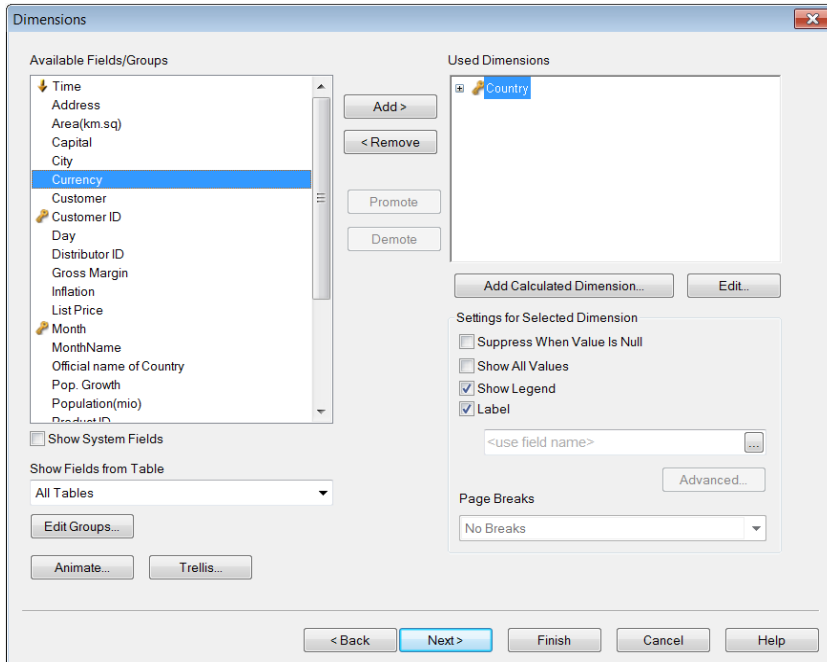



Figure 11. The Dimensions page

You will now create the same chart one more time - this time using the full chart wizard.

- 1 While on the sheet *Sales*, click the **Create Chart** button in the design toolbar. (Select **View - Toolbars - Design** to show the toolbar). The first page, **General**, of the chart wizard appears. On this page you can choose the type of chart you would like to work with. The bar chart option is preselected; leave it that way. 
- 2 Type *Sales 2* in the box **Window Title** and *Sales per Country* in the box under **Show Title in Chart**. Make sure the corresponding check box is marked.
- 3 Click **Next >**.

The second page of the wizard, **Dimensions**, opens. Here you can set the dimensions to be shown on the x-axis (in this case you want each bar to symbolize a *country*).

The left list contains all the fields or groups (you'll learn more about groups on page 191) available.

- 4 Select the field *Country*, then click **Add>** to move it to the list of displayed fields. (You can also double-click the field to move it.)
- 5 Click **Next >**.

The dialogs **Expression** and **Edit Expression** open. Use them to set one or more expressions to be displayed on the y-axis (in this case you want the height of each bar to show the *sum of sales* for that country). You can enter an expression directly into the edit box below **Expression OK**, but it is also possible to use the predefined functions in the fields **Aggregation** and **Field**.

- 6 Click the arrow belonging to the **Aggregation** drop-down list and select *Sum*. Then click the arrow belonging to the **Field** drop-down list (containing the field names) and select *Sales*.

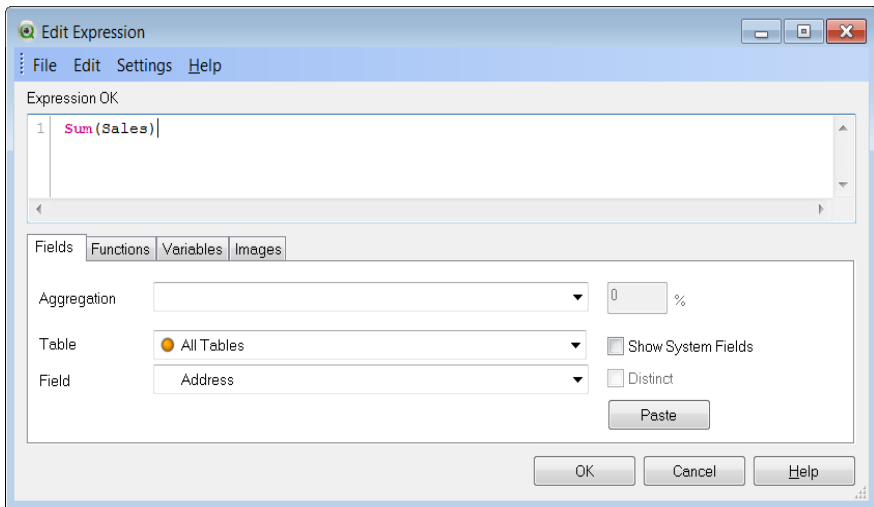


Figure 12. The Edit Expression dialog

- 7 Click **Paste**. The expression appears in the edit box in the upper part of the dialog. You can also write the expression directly into the edit box.
- 8 Click **OK**. The dialog closes. The expression you just defined appears in the **Definition** field (the left part) of the **Expressions** dialog. You have now selected one variable and one expression, i.e. performed the basic steps of the creation of a chart.

- 9 Type *Sales* into the **Label** box of the **Expressions** dialog. This changes the name of the expression, see “The Expressions dialog” on page 67.

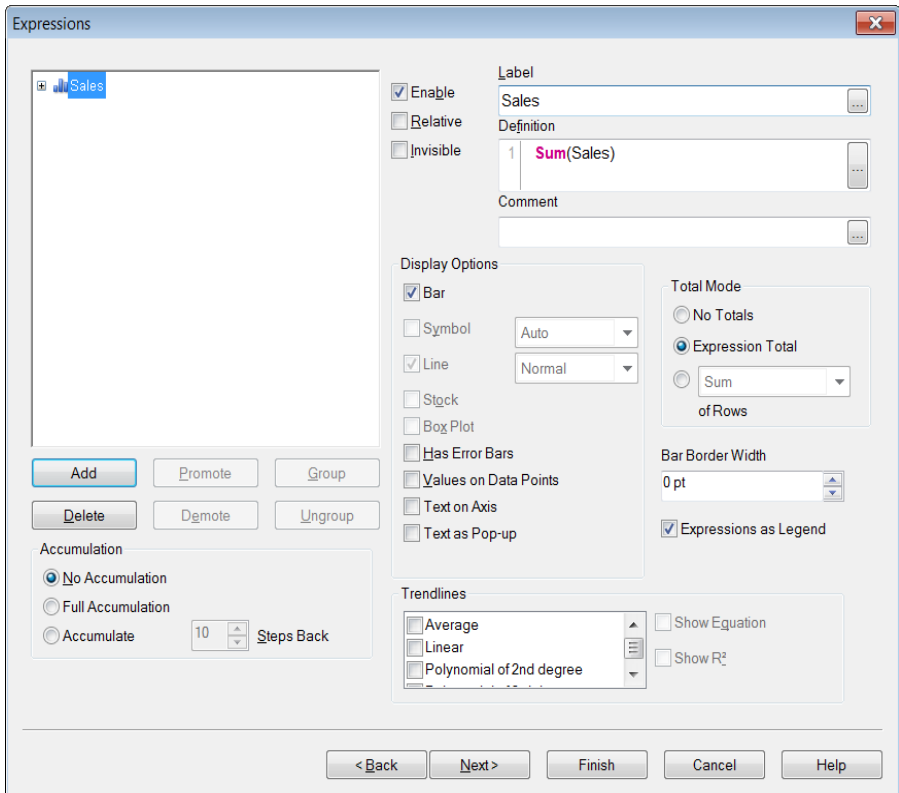


Figure 13. The Expressions dialog

- 10 Click **Next >** several times until you reach the **Caption** page.
- 11 Mark the check box **Auto Minimize**.
- 12 Click **Finish** to close the wizard. This closes the wizard immediately.

Select Ann Lindquist in the *Salesman* box if she is not already selected. Compare this chart to the chart (*Sales 1*) that you created in the previous section. You will notice that there are no numbers displayed on top of the bars. The bars are also sorted differently. This is due to different property settings. Below you will learn how to modify the properties to change the appearance of your chart.

Removing a chart

You only need one of the charts you created.

- 1 Right-click on the chart *Sales 1*, then choose **Remove** from the float menu.
- 2 Confirm that you want to remove the chart.

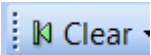
Changing a few properties

The chart wizard that helped you create the chart contains several pages, of which you only used three. No need to worry: all the pages of the chart wizard are also found in the **Properties** dialog of the chart, which can be opened at any time by right-clicking somewhere in the chart.

The pages of the Properties dialog differ a little depending on the chart type that you have chosen. However, they look the same no matter if you have used the QuickChart or the full chart wizard to create your chart. You will now use a few of the settings found on the remaining pages.

Changing the sort order

The chart is currently sorted in alphabetical order. You may prefer to put the main customer country furthest to the left:

- 1 Click on the chart with the right mouse button, then choose **Properties...** from the float menu.
- 2 Go to the **Sort** page.
- 3 Select the option **Y-value** to sort the countries according to their sums of sales.
- 4 Select **Descending** to put the highest bars to the left.
- 5 Click **OK**.
- 6 Clear your selections by clicking the **Clear** button in 

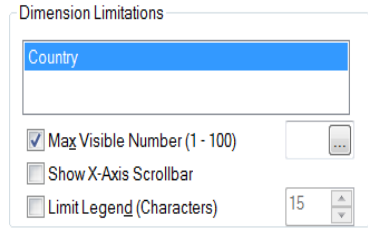
Limiting the number of bars

In order to improve the overview of the chart, you can limit the maximum number of bars to be displayed:

- 1 Click in the chart with the right mouse button, then choose **Properties...** from the float menu
- 2 Go to the **Presentation** dialog page by clicking its tab.

- 3 Mark the check box **Max Visible Number**. Select the number 10.
- 4 Click **Apply**, then **OK**.

Clear your selections. Only 10 bars are shown in the chart, which improves the overview.



Displaying numbers on the bars

The next thing we want to do is to display numbers on top of the bars in our chart.

- 1 Open the **Expressions** page in the **Chart properties** dialog.
- 2 Select **Numbers on Data Point**.
- 3 Click **OK**.

You have now added the y-value numbers (in this case sales figures) on top of the bars.

Changing the number format

Displaying the numbers on top of the bars is very useful, but when a large range of values is shown, there is not enough room for all the numbers. You can solve the problem by changing the number format:

- 1 Open the **Number** page in the **Chart Properties...** dialog.
- 2 **Expression default** is preselected here. Change it to **Fixed to**.
- 3 Change the value in the **Decimals** box to 0 (if it isn't set to 0 already).
- 4 Enter *1,000 \$* in the box **Thousand Symbol**.
- 5 Click **OK**.

The numbers on top of the bars now have much more space.

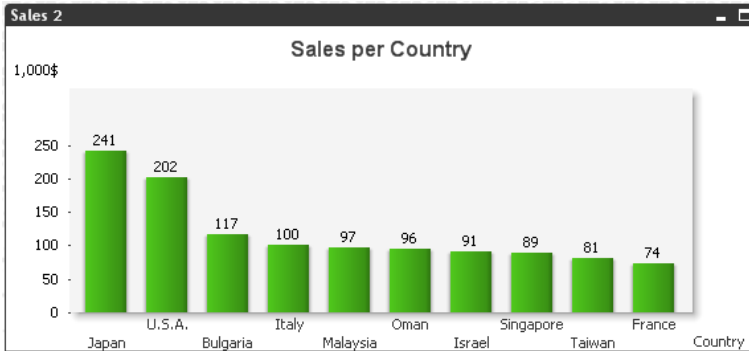


Figure 14. The bar chart now shows the sum of sales for different countries sorted by y-value (sum of sales).

Cloning and detaching your chart

You can clone (copy) a chart in the same way as a list box (by CTRL-dragging), but there is also another way of doing it:

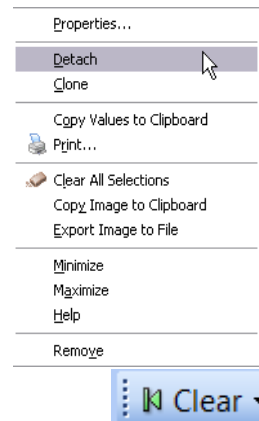
- 1 Click on the chart with the right mouse button to open the float menu.
- 2 Click **Clone**.

A second chart, identical with the first one, appears on the screen.

- 3 Move the chart so that all sheet objects are visible again.
- 4 Click on the new chart with the right mouse button to open the float menu.
- 5 Choose **Detach**. See the picture...

A detached chart is not updated when selections are made. This can be useful when you want to keep the overview while making selections.

- 6 Make a few selections. See how the original chart is updated, whereas the detached chart stays the same.
- 7 Attach the chart again by choosing **Attach** from the float menu.
- 8 Clear your selections by clicking the **Clear** button in the toolbar.



Turning the bar chart into a pie chart

There are several different chart types to choose between, each one with properties that suit certain purposes. You'll now turn the second bar chart into a pie chart.

- 1 Click on the *Sales* chart with the right mouse button, then choose **Properties...** from the float menu.
- 2 On the **General** page, select the option **Pie chart**.
- 3 On the **General** page you can also change the chart title and window title. Change the chart title to *Sum of Sales* as shown in the example below. The window title, *Sales*, will be shown in the title bar of the window.

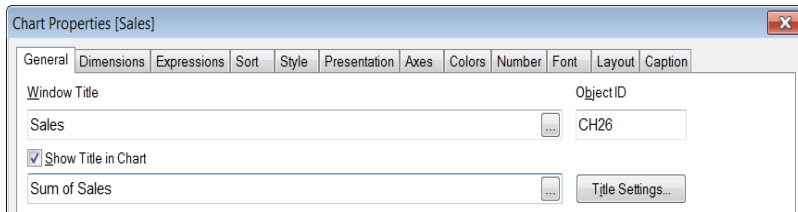


Figure 15. Window title and chart title

- 4 Go to the **Presentation** page.
- 5 Mark the check box **Show Numbers in Legend** (corresponds to **Numbers on Data Points** for bar charts).
- 6 On the **Style** page you can pick a style for your pie chart.

- 7 Click **OK**. The result is a pie chart where each slice represents the sales in a particular country.

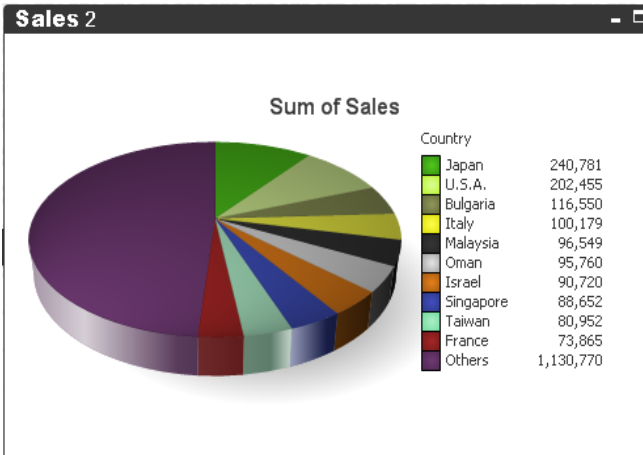


Figure 16. The resulting pie chart

Changing the color settings

Go to the previously created bar chart (*Sales 2*). Note that all the bars have the same color. This can be changed on the **Colors** page:

- 1 Click on the bar chart with the right mouse button, then choose **Properties...** from the float menu.
- 2 Go to the **Colors** page.
- 3 Select the check box **Multicolored**.
- 4 Choose **OK**.

Compare the colors used in the bar chart with those of the pie chart. You see that the same colors are used for the same countries. This default setting is very useful in that it enhances the consistency between different charts and sheets.

The colors of the color map can be customized: on the **Colors** page, simply click a color that you would like to change and pick the color of your choice from the map that opens.

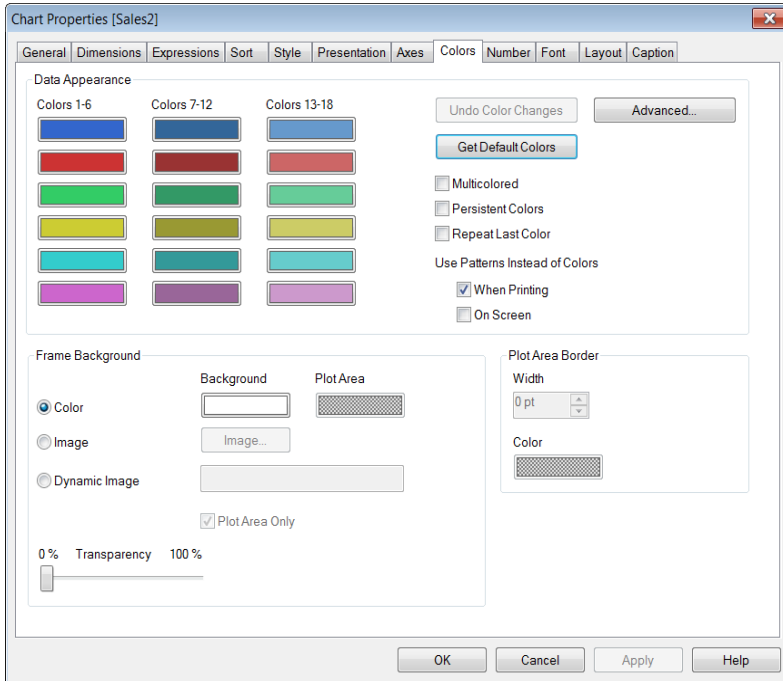


Figure 17. The dialog where the colors used in the bar chart are set.

Showing the percentage

Since the pie chart illustrates proportions, one might be more interested in knowing the percentage than the actual sum of sales.

- 1 Click on the pie chart with the right mouse button, then choose **Properties...**
- 2 Go to the **Expressions** page.
- 3 Mark the check box **Relative**.
- 4 Click **OK**.

The percentage numbers now appear in the legend.

To save space, you can minimize the pie chart:

-
- 5 Click on the pie chart with the right mouse button, then choose **Minimize**.

The chart turns into an icon and is placed where there is space on the screen. You can move the icon freely.

- 6 Repeat these steps to minimize the bar chart that you created in the previous lesson.

In the next lesson, you'll add another dimension to an existing bar chart and create pivot tables and straight tables.

Saving, closing and exiting

If you don't want to turn to the next lesson right away, you can close the document. You should also save the document, since the following lessons are based on the work you've done so far.

LESSON 5 PIVOT TABLES AND STRAIGHT TABLES

In this lesson, you will continue creating and using charts. After adding a dimension to an existing bar chart, you will turn it into a pivot table. Subsequently, you'll create a straight table containing the same information to compare these two ways of presenting data.

Opening the document

- 1 Start QlikView.
- 2 Open the file *MyTutorial.qvw*.

If *MyTutorial.qvw* is among the most recently used files, you can normally open it directly from the **start page**.

Adding a dimension to a bar chart

Until now you have worked with only one dimension and one expression. Charts can be very complex, though. They can show several dimensions and/or expressions simultaneously or sequentially.

You'll start by creating a chart with two variables and one expression. It will still show the sum of sales per country, but grouped over different years:

- 1 On the *Sales* sheet you find the minimized chart *Sales per Country*. It is very similar to the bar chart *Sales 2* that you created in the previous lesson.
- 2 Restore the chart and right-click it, then choose **Properties....**
- 3 On the **General** page, change the window title and the chart title to *Sales per Year*.
- 4 On the **Dimensions** page, move *Year* to the list of **Used Dimensions**.
- 5 On the **Style** page, set **Subtype** to **Stacked**.
- 6 On the **Presentation** page, set 5 as **Max Visible Number**.

7 Click **OK** to finish the chart.

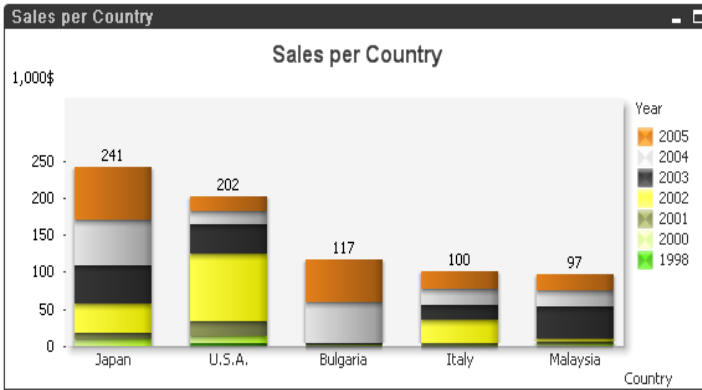


Figure 18. A bar chart with two dimensions

A bar still represents the sum of sales of a specific country, but it is now divided into different color sections representing different years.

Turning a bar chart into a multidimensional pivot table

Displaying data graphically is very illustrative, but you can't show too much information at the same time without losing clarity. To display calculated data for several dimensions, your choice of chart may be a pivot table:

- 1 Right-click to open the **Properties** dialog of the bar chart you just added a dimension to (*Sales per Year*).
- 2 On the **General** page, select **Pivot table** and choose **OK**.
- 3 To sort the *Country* column from A to Z, right-click the pivot table again. Go to the **Sort** page and choose *Ascending* for the *Country* dimension. Click **OK**. The pivot table is now sorted differently.

The pivot table is a very flexible sheet object, allowing you to freely drag and drop the different dimensions and expressions to any position on the vertical or horizontal axis.

Dragging dimensions

In this case, you would probably prefer to present the dimension *Year* on the horizontal axis. Do the following:

- 1 Position the mouse cursor on the field *Year*.
- 2 Press the mouse button and drag the field upwards, to the right, to the desired position (below the header row). A blue arrow appears when the cursor is in the right place.

Country	Year	Sales
Tanan	2005	69,717
	2004	52,452
	2003	50,818
	2002	40,496

Figure 19. Dragging the *Year* column to the horizontal axis

- 3 Release the mouse button. The dimension *Year*, as well as the expression values, are now displayed on the horizontal axis.

Country	Year	1998	1999	2000
Afghanistan	-	-	-	-
Albania	-	-	-	6,0
Armenia	-	-	-	-
Australia	-	-	1,030	1,2
Azerbaijan	-	-	-	1,2
Bahrain	-	-	-	1,0
Bangladesh	-	-	-	-
Belarus	-	-	-	1,2
Belgium	-	-	-	1,2

Figure 20. The years are displayed on the horizontal axis.

The first field (*Country*) is now shown as a regular column. The values in the second field (*Year*) act as headers for the remaining columns. The columns contain the values of the expression (*Sum of Sales*).

- 4 Drag the dimension *Year* back to form a vertical column and place it to the right of the dimension *Country*.

Adding a dimension

To add another dimension, do the following:

- 1 Open the **Properties** dialog and go to the **Dimensions** page.
- 2 Double-click the dimension *Salesman* to move it to the list of displayed fields, then click **OK**.

The dimension appears on the vertical axis. The pivot table should now look like below:



Country	Year	Salesman	Sales
Afghanistan	2001	Olivier Simenon	2,150
Albania	2000	John Lemon	6,000
	2002	John Lemon	2,590
Armenia	2001	Mario Kaddafi	1,850
Australia	1999	Rolf Wesenlund	1,030
	2000	Rolf Wesenlund	1,210
Azerbaijan	2000	Kaya Alpan	1,290
	2001	Kaya Alpan	4,039
Bahrain	2000	Ann Lindqvist	1,000

Figure 21. The pivot table with the dimension *Salesman* added

Expanding and collapsing dimensions

The pivot table provides yet another useful feature: the possibility of expanding and collapsing dimensions on value level. By collapsing the values you're currently not interested in, you considerably enhance the overview of your data.

You have probably noted the small signs \oplus and \ominus displayed in the top right-hand corners of the values in the columns. A minus sign indicates that the dimension on the next level is visible (expanded), whereas a plus sign indicates that it is hidden (collapsed). At the moment all the values of all columns are shown.

- 1 Click in the *Year* column with the right mouse button, then choose **Collapse all**.
- 2 Right-click in the *Country* column, then choose **Collapse all**.

All the values of the dimensions *Salesman* and *Country*, previously shown, are now hidden. Suppose that you are only interested in the sales performed in Belgium:

- 3 Click the plus sign of the value *Belgium*.

- 4 Click the plus sign of the values *2002* and *2003*.

Country	Year	Salesman	Sales
Afghanistan			2,150
Albania			8,590
Armenia			1,850
Australia			2,240
Azerbaijan			5,329
Bahrain			1,090
Bangladesh			4,240
Belarus			26,065
Belgium	2000	Charles Ingvar J...	1,210
	2002	Charles Ingvar J...	3,159
		John Cleaves	2,550
	2003	Tony Cedholt	2,500
		Charles Ingvar J...	3,690


Figure 22. The pivot table showing details for Belgium

You are now showing only those values of the following columns that are related to the value *Belgium*. Details on salesmen are only visible for *2002* and *2003*.

To show a hidden (collapsed) column, right-click in the column to the left of it and select **Expand all**.

Adjusting the columns

The *Country* column of the pivot table is not wide enough for certain values.

- 1 Place the cursor on the line separating the *country* column from the *year* column.
- 2 When the cursor looks like the one shown in the figure, press the mouse button and drag. 
- 3 All the columns can be sized this way. To adjust the rightmost column, place the cursor within the border (to the left of the scroll bar) and drag.

You can also adjust the columns using the command **Fit Columns to Data** in the float menu (opens on a right-click).

Showing partial sums

At the moment, the table shows the sales for Belgium during different years. Suppose you wish to know the sum of sales during all the years together. Do the following:

- 1 Choose **Properties...** from the float menu.
- 2 Go to the **Presentation** page.
- 3 In the **Dimensions and Expressions** list, select the variable *Year*.
- 4 Mark the check box **Show Partial Sums**.
- 5 Click **OK**.

The pivot table now shows partial sums on year level.

Creating a straight table

In opposition to the pivot table, the straight table cannot display sub-totals or serve as a cross table. On the other hand, any of the columns of the straight table can be sorted and each of its rows contains one combination of dimension(s)+expression(s).

- 1 Minimize the pivot table on the *Sales* sheet to increase the free space.
- 2 Right-click somewhere on the sheet and select **New Sheet Object**, then choose **Chart**.
- 3 In the wizard that opens, select **Straight table**.
- 4 Type *Salesman* in the box **Window title**.
- 5 Click **Next >**.
- 6 On the **Dimensions** page, move *Year*, *Country* and *Salesman* to the **Used Dimensions** box. Use the **Promote** and **Demote** buttons in order to sort the dimensions as shown in the picture.
- 7 Click **Next >**.
- 8 The **Edit Expression** dialog opens.
- 9 Compose the expression *Sum of Sales* by selecting the corresponding items from the lists in the combo boxes (**Aggregation** and **Field**).
- 10 Click **Paste**.
- 11 Click **OK**.
- 12 Type *Sales* in the **Label** box in the **Expressions** dialog.



13 Click **Finish**.

Salesman			
Year	Country	Salesman	Sales
			2317233
2001	Afghanistan	Olivier Simonon	2150
2000	Albania	John Lemon	6000
2002	Albania	John Lemon	2590
2001	Armenia	Mario Kaddafi	1850
1999	Australia	Rolf Wesenlund	1030
2000	Australia	Rolf Wesenlund	1210
2000	Azerbaijan	Kaya Alpan	1290
2001	Azerbaijan	Kaya Alpan	4039
2000	Bahrain	Ann Lindquist	1090
2003	Bangladesh	Kaya Alpan	4240
2000	Belarus	John Lemon	1270
2002	Belarus	John Lemon	5998
2004	Belarus	John Lemon	8698
2005	Belarus	John Lemon	10099
2000	Belgium	Charles Ingvar...	1210

Figure 23. The resulting straight table

You now have a straight table containing the same information as the pivot table. Compare the two tables. Notice that in the straight table, the total sum of sales is shown at the top, that each row in the straight table represents a possible combination of data (in the pivot table, data is grouped by field values), and that no partial sums are given.

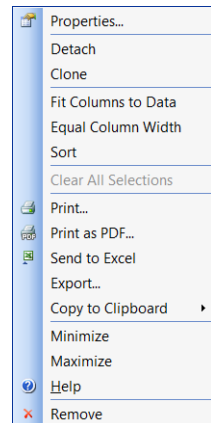
Sorting the table

The straight table provides excellent possibilities for sorting columns.

Currently, the column *Year* is placed furthest to the left, and the table is sorted according to the sort order specified for this field (**Sort** page). You can see this from the little arrow sort indicator in the column header. You can change the sort order of the table with two simple clicks of the mouse:

- 1 Right-click on the column *Salesman* to open the float menu.
- 2 Choose **Sort**.

The order of the columns remains the same, but it is now the sort order defined for the field *Salesman* that determines the order of



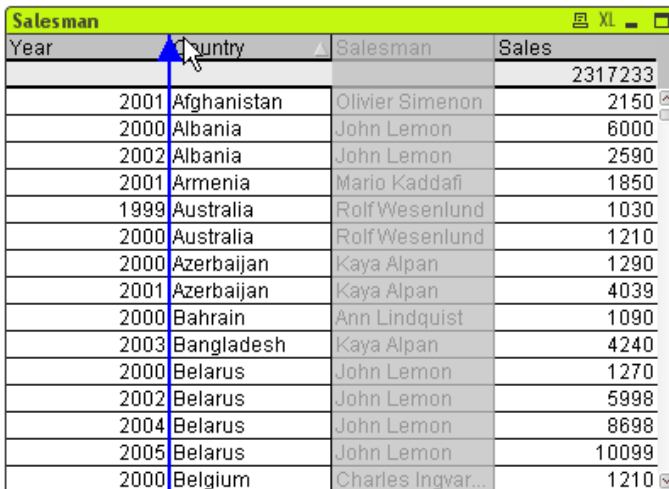
the values in the table. Note how the sort indicator (arrow) has moved to the *Salesman* column.

The sort priority can also be set on the **Sort** page of the **Properties** dialog.

Moving a column

Suppose you want the field *Salesman* to the left of the *Country* column. Do the following:

- 1 Press the mouse button while on the column header *Salesman* and drag the column to the desired position. The selected column is highlighted and the target is marked with an arrow while you are dragging.
- 2 Release the mouse button. The field *Salesman* is now placed further to the left.



The screenshot shows a table with four columns: Year, Country, Salesman, and Sales. The Salesman column is highlighted in light blue, and a mouse cursor is positioned over its header. A blue arrow points from the Salesman header to the Country header, indicating the drag operation. The table contains data for various countries and years, with sales figures ranging from 1090 to 10099.

Year	Country	Salesman	Sales
			2317233
2001	Afghanistan	Olivier Simenon	2150
2000	Albania	John Lemon	6000
2002	Albania	John Lemon	2590
2001	Armenia	Mario Kaddafi	1850
1999	Australia	Rolf Wesenlund	1030
2000	Australia	Rolf Wesenlund	1210
2000	Azerbaijan	Kaya Alpan	1290
2001	Azerbaijan	Kaya Alpan	4039
2000	Bahrain	Ann Lindquist	1090
2003	Bangladesh	Kaya Alpan	4240
2000	Belarus	John Lemon	1270
2002	Belarus	John Lemon	5998
2004	Belarus	John Lemon	8698
2005	Belarus	John Lemon	10099
2000	Belgium	Charles Ingvar...	1210

Figure 24. Dragging the *Salesman* column

Visual cues

You can use visual cues to highlight expression values in the table. Values belonging to different value categories can be given separate colors and/or font styles.

- 1 Click on the straight table with the right mouse button, then choose **Properties...** from the float menu.
- 2 Go to the **Visual Cues** page.
- 3 *Sales* is the expression available. Select it in the text box.

There are four value categories to choose between: upper, normal, lower and text. Suppose you want to highlight all the expression values above 10,000:

4 Type 10000 in the **Upper >** edit box.

Next to the edit box, you find two color buttons and three check boxes. This is where you set the appearance of the text and/or the background of the values you wish to highlight.

5 Suppose you want to apply a red color to the values belonging to the upper value category. Click the **Text** button, then choose a red color from the color map. Click **OK**.

6 In addition, check the **Bold** check box.

7 Click **OK**.

All the expression values above 10,000 are now highlighted.

Selections in table charts

It is of course possible to make selections in pivot tables and straight tables as well. Clicking those columns (or rows in a pivot table) which contain chart dimensions implies direct selection of the values clicked on.

1 Click the value *2002* in the *Year* column. The effect is the same as selecting *2002* in the list box *Year*.

2 Clear your selections.

Clicking a column containing a chart expression implies an indirect selection of those values in the dimension columns (rows) that are used to calculate that expression value.

3 Click the value *\$11,379* in the column *Sales*. You have now selected the value *2003* in *Year*, the value *Pakistan* in *Country* and *Ann Lindquist* in *Salesman*.

4 Clear your selections.

If you need to make more complex or multiple selections in a table chart there is yet another option, called drop-down select. This feature makes it possible to turn a dimension column into a drop-down list with full selection and search possibilities.

1 Right-click the *Salesman* straight table and select **Properties...** from the float menu.

2 Go to the **Presentation** page.

3 Mark *Year* in the list of **Columns** and check the check box **Drop-down Select**.

- 4 Repeat for the *Country* and *Salesman* columns.
- 5 Click **OK**.

You will now find that all three dimension columns have a drop-down icon to the left in the column header.

- 6 Click the icon for *Year* and a temporary list box with all the years will appear. Hold down the CTRL key and click the years 2000, 2003 and 2004. Then release the CTRL key. The three years are now selected and the drop-down list is closed.

man	1998	Country
	1999	
Iqquist	2000	S.A.
Iqquist	2001	hrain
Iqquist	2002	ilippines
Iqquist	2003	ilippines
Iqquist	2004	kistan
Iqquist	2005	kistan
Iqquist	2003	Philippines

- 7 Click the drop-down icon in the *Country* column. When the drop-down list appears, type "sw". This text search will result in *Botswana*, *Swaziland*, *Sweden* and *Switzerland*. Press ENTER. Now you see available information about the countries. Only *Sweden* and *Switzerland* are shown in the straight table because there is no relevant information about the other countries.
- 8 Clear your selections.

Moving the pivot table and the straight table to a new sheet

The *Sales* sheet is looking crowded. To improve the overview, you'll create a new sheet for the tables.

- 1 From the **Layout** menu, choose **Add Sheet**. The tab **Sheet 3** appears to the right of the **Sales** tab.
- 2 Right-click somewhere in the new sheet to open the sheet's **Properties** dialog.
- 3 On the **General** page, enter *Tables* in the **Title** box. In this dialog you can also change layout settings for the sheet and its tab. After making your settings, click **OK** until all dialogs are closed.
- 4 Go back to the *Sales* sheet.
- 5 Select the pivot table and keep the mouse pointer depressed while dragging it to the *Tables* tab. Release the mouse button when the cursor turns into a rounded arrow. See "Copying sheet objects" on page 44.
- 6 Select the straight table and move it to the *Tables* tab the same way.

- 7 Go to the new *Tables* sheet. The pivot and straight tables are placed in the same position as on the *Sales* sheet. You may want to move them to a different position on the sheet.

There is now room for further charts on the *Sales* sheet. In the next lesson, you'll work with line charts, combo charts, scatter charts and bar charts with drill-down functionality. The next lesson also contains information on printing and exporting charts.

Auto Minimize

In order to improve the overview on the *Sales* sheet even more, you want to set some of the charts to **Auto Minimize**., meaning that only one of the Auto Minimized charts will be shown at any one time.

- 1 On the *Sales* sheet, right-click the *Sales Forecast* chart and go to the **Caption** page of the **Properties** dialog.
- 2 Mark the check box **Auto Minimize** and click **OK** to close the dialog.
- 3 Repeat steps 1 and 2 for the bar chart called *Drill-down*, the pie chart called *Sum of Sales* and the bar chart called *Sales per Country*. If a chart is minimized, you can also right-click its icon to reach the **Properties** dialog.
- 4 Restore the pie chart by double-clicking its icon. Note that the other charts on the sheet are minimized and shown as icons.
- 5 Now restore the *Drill-down* chart. The pie chart is automatically minimized.

You can also make this change for several charts at once:

- 1 "Paint" a rectangle with the mouse painter around the charts that you want to modify. Their captions or minimized icons turn green.
- 2 Right-click one of the selected charts or icons to reach the **Properties** dialog for all the objects. Note that the dialog in this case is limited to the **Layout**, **Caption** and **Font** pages.

On the **Caption** page you find the **Auto Minimize** check box. If it is already selected, this means that one of the charts that you selected already has the **Auto Minimize** setting.

- 3 Deselect the **Auto Minimize** check box, then select it again. The change is now made to all your selected charts.

Saving, closing and exiting

If you don't want to turn to the next lesson right away, you can close the document. You should also save the document, since the following lessons are based on the work you've done so far.

LESSON 6 MORE CHART TYPES

This lesson introduces further chart types. The line chart is useful for showing trends or changes. Working with a combo chart, you can combine the features of the bar chart with those of the line chart. As for scatter charts, they show pairs of values from two expressions. Gauge charts are used for displaying one specific value. You will also encounter drill-down functionality in a hierarchic bar chart created out of a field group. At the end of the lesson, you'll print and export a chart.

Opening the document

- 1 Start QlikView.
- 2 Open the file *MyTutorial.qvw*.

If *MyTutorial.qvw* is among the most recently used files, you can normally open it directly from the **start page**.

Creating a line chart

Instead of being displayed as bars, data can be presented as lines between value points, as value points only or as both lines and value points. Line charts are useful for showing changes or trends.

You'll create a line chart illustrating how the sales per customer have changed over the years.

- 1 Go to the *Sales* sheet.
- 2 Click the **Create Chart** button in the toolbar.
- 3 Select **Line Chart**, and type *Customer* as **Window Title**.
- 4 Click **Next >**.
- 5 On the **Dimensions** page, move the fields *Year* and *Customer* to the column of displayed fields. It is important that *Year* comes before *Customer* in this example. Use the **Promote** and **Demote** buttons to define the order.
- 6 Click **Next >** to create an expression in the **Edit Expression** dialog.
- 7 In the fields **Aggregation** and **Fields**, create the expression *Sum(Sales)*, then click **Paste**.
- 8 Click **OK**. The **Edit Expression** dialog closes and you are back on the **Expression** page.



- 9 Under **Display Options**, mark the checkbox **Smooth Line** and click **Finish**. When no values are selected, the chart looks a bit overcrowded; as soon as you make a selection, though, the trends will appear very clearly.
- 10 Clear previous selections by clicking the **Clear** button in the toolbar.
- 11 Select *Atlantic Marketing* in the list box *Customer* and study the result.

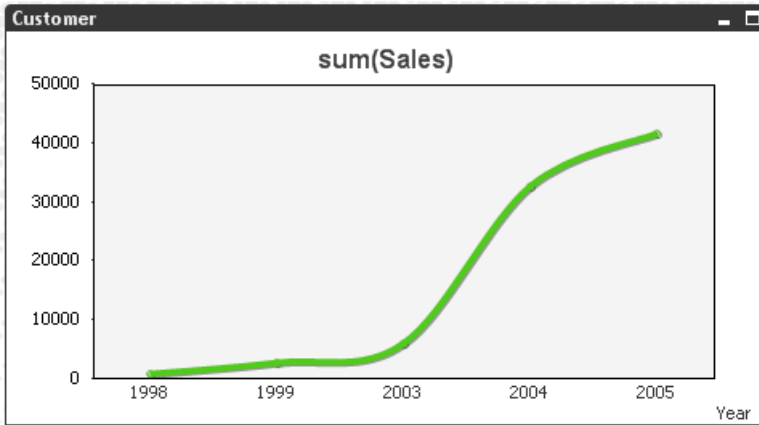


Figure 25. A line chart showing the sales fluctuation for the customer *Atlantic Marketing*

- 12 Undo your selection by clicking on the list box *Customer* with the right mouse button and choosing **Clear** from the float menu.
- 13 Select *John Doe* in the list box *Salesman*.

One now gets a clear picture of Mr. Doe’s doings. We see that he has had business contacts with Carlsborg since 1999, and that the company Mary Kay has meant a lot to his career so far. We also see that he wasn’t very successful with Captain Cook’s Surfing School.

Suppose you want to know if Captain Cook’s Surfing School is still our customer after all.

- 14 Select *Captain Cook’s Surfing School* in the list box *Customer*.
- 15 Right-click the field *Captain Cook’s Surfing School* and choose **Clear Other Fields**. All other fields (including *John Doe*) are automatically deselected.

No need to worry: the surfing school is still our customer, even though it purchased less during 2004 and 2005. In the pivot table that we moved to the *Tables* sheet you can study the exact data.

16 Clear your selections and minimize the chart.

Adding an expression to a bar chart

Suppose you would like to see how the number of customers is related to the population of a certain country.

- 1 Go to the **Geography** sheet where you find a bar chart called **Population**.
- 2 Copy the chart to the **Sales** sheet: right-click the chart (or its icon, if it is minimized), choose **Clone** from the float menu, then drag it to the *Sales* tab. Release the mouse button when the cursor turns into a rounded arrow.
- 3 Click on the chart with the right mouse button, then choose **Properties...** from the float menu.
- 4 On the **General** page, change the window title to *Customers/Population*.
- 5 Select the check box **Show Title in Chart**, and type *Customers/Population* in this box too.
- 6 On the **Expressions** page, click **Add** to open the **Edit Expression** dialog.
- 7 Compose *Count (Customer)* by selecting *Total Count* in the field **Aggregation** and *Customer* in the field **Field**, then click **Paste**.
- 8 Click **OK** to close the Edit Expression dialog.
- 9 Make sure the expression *Count (Customer)* is selected in the list to the left, and type *Customers (nr)* into the **Label** box.
- 10 Still in the **Expressions** dialog, select the expression *Population* and type *Population (mio)* in the label box.
- 11 Click **OK**.

Study the chart. You have set both population and number of customers as expressions, but only the population is shown. The reason for this is that both expressions are shown on a single axis, and that the magnitude of the numbers of the two expressions differs so much that the number of customers is not visible.

- 12 Right-click in the chart, select **Properties**. Go to the **Axes** page.
- 13 Select *Customers (nr)* in the **Expression Axes** box, then click **Right (Top)** under **Position**.
- 14 Click **OK**.

The chart shows the ten countries with the biggest population and the number of customers in these countries.

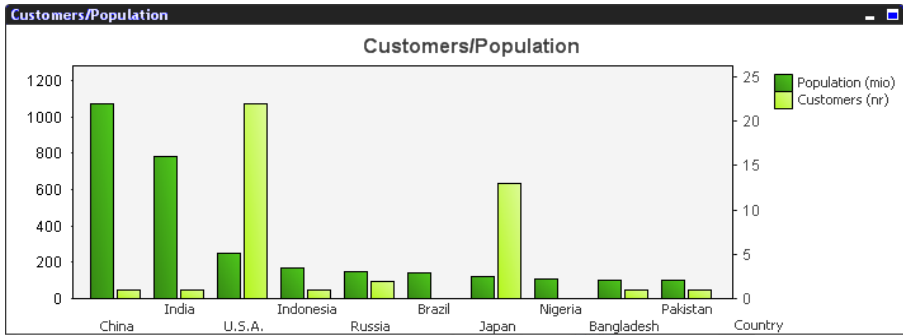


Figure 26. A bar chart showing the ten countries with the largest populations and the number of customers in each country.

Turning the bar chart into a combo chart

You will now turn the bar chart into a combo chart. In a combo chart, you can combine the features of the bar chart with those of the line chart, e.g. by showing one expression as bars and the second as lines and/or symbols.

- 1 Open the chart's **Properties** dialog.
- 2 On the **General** page, select **Combo Chart**.
- 3 Go to the **Expressions** page.

The expressions *Population (mio)* and *Customers (nr)* are listed in the **Expressions** box.

- 4 Select *Population (mio)*, then mark the **Bar** check box under **Display Options**. The boxes named **Line** and **Symbol** must not be marked.
- 5 Now select *Customers (nr)* in the **Expressions** box, then mark the check boxes **Symbol** and **Line**, leaving the check box **Bar** deselected. If you like, you can also mark the check box **Smooth Line**.
- 6 Click **OK**.

Instead of displaying both expressions as bars, the chart now shows the number of customers as symbols and lines.

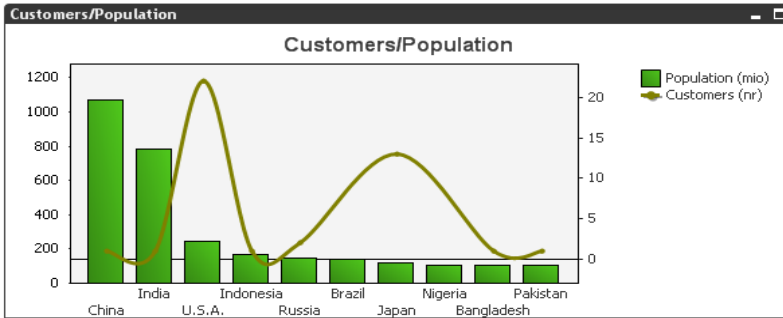


Figure 27. A combo chart showing how the population and the number of customers in different countries are related to each other.

Turning the combo chart into a scatter chart

When showing data where each instance has two numbers, like in this case (each country has a number of customers and a population), you might find the scatter chart a useful representation form:

- 1 Click on the combo chart with the right mouse button, then open the **Properties** dialog.
- 2 On the **General** page, select **Scatter Chart**.
- 3 Click **OK**.

The dimension (*Country*) is represented by the symbols, and the expressions (*Population* and *Customers*) are displayed on the axes. You immediately see that some of the countries are placed far out to the right on the x-axis, which means that their populations are far above the average. In two countries we already have more than 10 customers.

- 4 Select the countries with the most customers by "painting" the area in the chart using the mouse button.

You see that the countries are Japan and USA.

5 Clear your selections and minimize the chart.

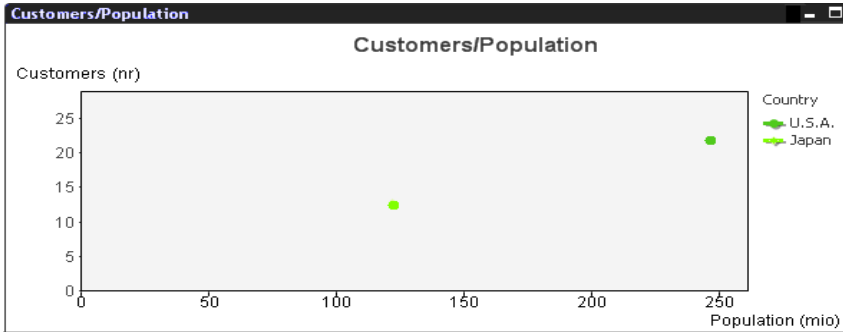


Figure 28. A scatter chart showing how population and number of customers are related to each other.

Creating a scatter chart from scratch

You will now create a similar scatter chart, showing population and population growth:

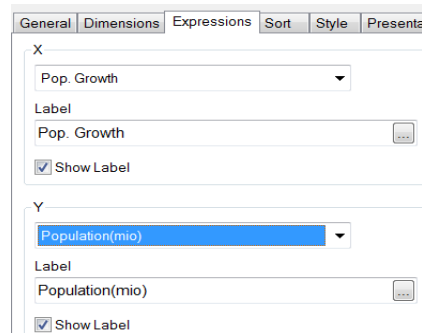
- 1 Go to the **Geography** sheet.
- 2 Click the **Create Chart** button in the toolbar.
- 3 On the **General** page, type *Population Growth* under **Window Title** and **Show Title in Chart**. Select the option **Scatter Chart**.
- 4 Choose **Next >**.
- 5 On the **Dimensions** page, move *Country* to the column of displayed fields.
- 6 Choose **Next >**.



- 7 The **Expressions** page of the scatter chart differs from that of the other charts. Choose *Pop. Growth* in the **X** combo box, and *Population (mio)* in the **Y** combo box.
- 8 Click **Finish**.

Your new scatter chart is finished. Move it, size it, and try it by making selections.

- 9 Minimize the new scatter chart.



- 10 Clear your selections and minimize the chart.

Creating a gauge chart

Quite often you want to view the changing value of a single measurement as you change your selections. For this purpose the gauge chart is ideal. QlikView offers a wide range of gauge charts for graphic visualization of values. In this section we will create a simple circular gauge chart indicating average gross margin for whatever set of customers and/or periods etc. that we have selected.

- 1 Go to the *Sales* sheet.
- 2 Click the **Create Chart** button in the toolbar.
- 3 Select **Gauge Chart**, and type in *Gross margin* as **Chart Title** and **Window Title**.
- 4 Click **Next >**.
- 5 On the **Dimensions** page, we do nothing at all, as most gauge charts are best calculated without any dimensions resulting in one single value over the entire data set.
- 6 Click **Next >** to create an expression in the **Edit Expression** dialog.
- 7 Create the expression *Avg([Gross Margin])* by selecting *Average* in the field **Aggregation** and *Gross Margin* in the field **Field**, then click **Paste**.
- 8 Click **OK**, then click **Next >** and **Next >**.
- 9 On the **Style** page, make sure that the circular gauge icon under **Look** is selected.
- 10 Click **Next >**.
- 11 On the **Presentation** page, enter the value 3000 under **Max** in the **Gauge settings** group. Change the color of segment 1 (left) to red and segment 2 (right) to green by clicking the colored buttons.
- 12 Still on the **Presentation** page, make sure that the checkbox **Show Scale** is selected and select **7 Major Units, Show Labels on Every 1 Major Unit and 2 Minor Units per Major Unit**. Click **Next >** several times until you reach the **Caption** page.
- 13 On the **Caption** page, mark the check box **Auto Minimize**.

-
- 14 Click **Finish**. A semi-circular gauge with two segments, one green and one red, will appear.

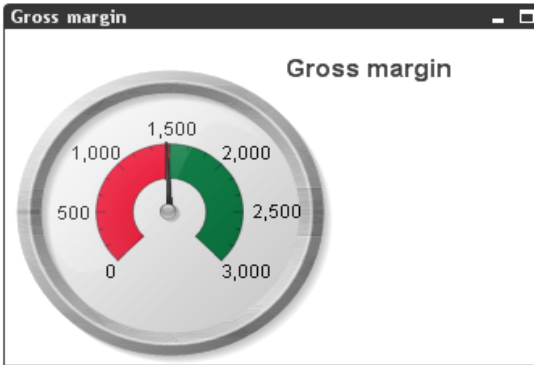


Figure 29. The gauge chart created above.

Let's do a bit of analysis!

- 15 Click the **Clear** button in the toolbar. The gauge now shows the average gross margin for all customers.
- 16 Select *Atlantic Marketing* in the *Customer* list box. This is a good customer!
- 17 Select *Barley Foods* instead. Room for improvement!

Working with drill-down functionality

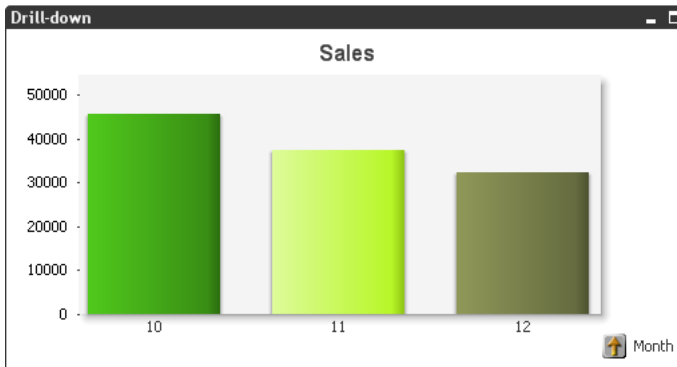


Figure 30. Drill-down functionality

A dimension used in a chart is usually equivalent to a single field, e.g. *Year*. However, you will sometimes encounter charts created out of field *groups*. These charts can be of two types, drill-down or cyclic. In a drill-down chart, the field group defined usually consists of fields forming a natural hierarchy, e.g. *Year*, *Quarter*, *Month*.

The *Sales* sheet in your document contains a minimized chart with drill-down functionality.

- 1 Clear all selections.
- 2 Go to the *Sales* sheet.
- 3 Restore the minimized chart called *Drill-Down* by double-clicking it.

The chart, showing the sum of sales per year, looks like any other bar chart. However, as soon as you make a selection causing the field *Year* to have only one possible value, you discover its drill-down character:

- 4 Select the bar *2002* in the chart.

An ordinary chart would now display one bar, representing the sum of sales for 2002. This chart, however, shows the sum of sales for each *quarter* of the year 2002 (the second field in the field list defined being *Quarter*).

- 5 Select the bar representing the fourth quarter.

The chart turns to showing the sales for each month of the selected quarter. *Month* is the third, and last, field in the field group.

Note the selections in the Current Selection box on the same sheet. Keeping track of selections is very important when working with drill-down charts.

-
- 6 To go back in the hierarchy, click on the drill-down button next to the field name.



As soon as more than one value becomes possible in the fields further up in the hierarchy, the chart is automatically drilled back up.

The creation of field groups will be discussed in *Advanced Features* (page 191).

You should now be familiar with most of the chart types available in QlikView: bar chart, line chart, combo chart, scatter chart, pie chart, pivot table, straight table and gauge chart as well as drill-down functionality in charts. The last section of this lesson will show you how to copy charts to Clipboard and how to print them.

Copying to Clipboard and printing

All sheet objects can be copied as images to the clipboard. Charts and tables can be printed. It is also possible to export the data contents of charts and tables to the clipboard.

Copying a sheet object to Clipboard

- 1 Click with the right mouse button on any chart to open the float menu.
- 2 Choose **Copy Image to Clipboard** and select **Values**. The other options are explained below.

You have a choice between **Values** (you copy the values from the chart and can paste them into another program), **Image** (you copy the chart as an image and you can paste it into other programs as an image) or **Object** (the copy is a clickable sheet object that can be pasted into another QlikView document).

- 3 To view the result, open a blank document in e.g. Word, and click **Paste** (in Word).
- 4 Close Word.

Printing

- 1 Go back to QlikView.
- 2 Click on a chart with the right mouse button, then click **Print...**

The **Print...** dialog opens. For detailed information about printing, see the *Reference Manual*.

- 3 Click **Print**.

It is also possible to choose the **Print...** command from the **File** menu or from the toolbar.

In the next lesson, the presentation tour goes on with the multi box and the table box.

Saving, closing and exiting

If you don't want to turn to the next lesson right away, you can close the document. You should also save the document, since the following lessons are based on the work you've done so far.



LESSON 7 MULTI BOXES, TABLE BOXES AND INPUT BOXES

This lesson features the multi box, which allows you to show data in a very compact way; the input box, which can be used for interactive input of data; and the table box which presents data in table format.

Opening the document

- 1 Start QlikView.
- 2 Open the file *MyTutorial.qvw*.

If *MyTutorial.qvw* is among the most recently used files, you can normally open it directly from the **start page**.

The multi box

The multi box, or multiple drop-down list box, is a sheet object that shows several fields simultaneously in a very compact way.

The multi box makes it possible to show a great number of fields on a single sheet without losing the overview.

Customer info		
Customer		<input type="radio"/>
Address		<input type="radio"/>
City		<input type="radio"/>
Zip		<input type="radio"/>
Country		<input type="radio"/>

How results of selections are shown in multi boxes

The *Geography* sheet contains a multi box showing country information.

For each field in the multi box, there is a selection indicator telling you if the values of the field are selected, optional or excluded.

A value will be shown in the multi box only if it is the single possible (optional or selected) one.

- 1 Clear all your selections by clicking the **Clear** button in the toolbar.
- 2 Select *Aus Dollar* in the *Currency* list box.

The selection indicators of the multi box are now all white, which means that all the fields contain optional values.

Most of the fields still have white selection indicators in the left column, and show nothing in the right column. This means that these fields contain sev-

eral optional values. *Aus Dollar* and *Not known* being the only possible values in their respective fields, they are shown in the multi box.

3 Now select *Australia* in the *Country* list box.

Values appear in all the fields. The multi box allows you to display a great amount of information in a limited space.

Multi box	
Capital	Canberra
Country	Australia
Official name of Country	the Commonwealth of Australia
Population(mio)	16
Pop. Growth	1.30%
Currency	Aus Dollar
Inflation	Not known

Creating a multi box

- 1 Go to the *Customers* sheet.
- 2 Clear your selections.
- 3 Click the **Create Multi box** button in the toolbar or choose **New Sheet Object, Multi box** from the **Layout** menu.



The **General** page of the **Multi Box Properties** dialog box now appears. Here you can choose the fields to display in the multi box.

- 4 Type *Customer info* in the **Title** box.
- 5 Select *Customer* in the column listing available fields, then click **Add>**.

The field *Customer* is moved to the column of displayed fields, which means that it will appear in the multi box. Select a few more fields:

- 6 Select *Address* by clicking the field in the list.
- 7 Press CTRL while clicking the fields *City*, *Country*, and *Zip*.
- 8 Click **Add>**
- 9 Click **OK**.

Customer info	
Customer	<input type="radio"/>
Address	<input type="radio"/>
City	<input type="radio"/>
Zip	<input type="radio"/>
Country	<input type="radio"/>

The multi box appears on your sheet.

Making selections in the multi box

You make selections in a multi box in the following way:

- 1 Clear your selections.
- 2 Open the field *Customer* by clicking the arrow.
- 3 Select *Gaston HiTech*.

There are optional values in all the boxes.

- 4 Open the field *Country* by clicking the arrow.
- 5 *Belgium* and *France* are optional. The French address is the one you need: click *France*.



The requested information appears in the remaining fields of the multi box.

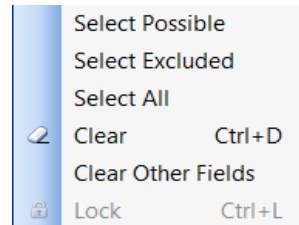
The properties of the multi box can be changed just like those of other sheet objects.

- 6 Right-click on the caption of the multi box. Have a look at the float menu before you open the dialog **Multi Box Properties**.

The **Properties** dialog of the multi box contains six pages that look similar to those of the list box. Here you make changes that affect the entire multi box.

- 7 Close the dialog **Multi Box Properties** and go back to the multi box. Right-click on the field **Customer**.

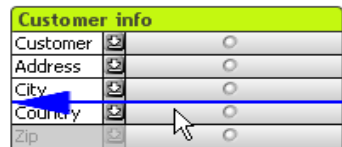
Look closely at the float menu that opens. You will see that the commands in the second group (as shown in the picture) apply to the field you have clicked on, whereas the other groups of options are the same as for the entire multi box. These operate on all its fields.



Promoting a field

Maybe you would prefer to let the field *Zip* precede *Country*.

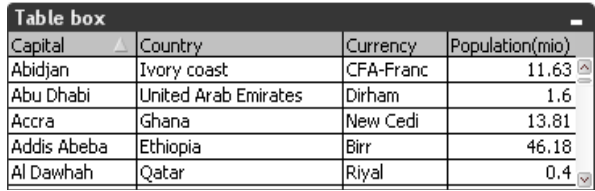
- 1 Click in the white area in the field *Zip* and keep the mouse button depressed while dragging upwards. A blue arrow appears.
- 2 Let go of the mouse button when the arrow is above the field *Country*.
- 3 Clear your selections.



You can also change the order of the field using the **Promote** and **Demote** buttons on the **General** page of the **Multi Box Properties** dialog.

The table box

The table box is a sheet object that shows several fields simultaneously. The contents are record-oriented in the same way as a normal table, i.e. the contents of one row are logi-



Capital	Country	Currency	Population(mio)
Abidjan	Ivory coast	CFA-Franc	11.63
Abu Dhabi	United Arab Emirates	Dirham	1.6
Accra	Ghana	New Cedi	13.81
Addis Abeba	Ethiopia	Birr	46.18
Al Dawhah	Qatar	Riyal	0.4

cally connected. The columns of the table box can be loaded from different input tables, which allows the user to create a new table from the logically possible combinations of the input tables.

At the first glance, the table box may look similar to the straight table: both are record-oriented, i.e. each row contains a possible combination of data. However, there are fundamental differences between the two sheet objects, the most important one being that table boxes cannot show calculated values.

Making selections in a table box

The sheet *Geography* contains a table box called **Table Box**.


Just like the other sheet objects, the table box immediately reflects selections made in other sheet objects.

- 1 Select a few countries in the list box *Country* and study the result. You can make selections in a table box by clicking any of the available field values or by "painting" an area:
- 2 Select a range of values in the table box. See how the contents change.
- 3 Clear your selections.

Creating a table box

- 1 Go to the sheet *Customer*.

The sheet contains a multi box with the fields *Customer*, *Address*, *City*, *Zip*, and *Country*. You will now create a table box with the same fields:

- 2 Click the **Create Table Box** button in the toolbar. 
- 3 The **General** page of the **Table Box Properties** dialog is now open. Enter the text *Customer info* in the **Title** box.
- 4 Double-click the fields mentioned above to move them to the column of displayed fields. Use the **Promote** and **Demote** buttons if you need to change the order of the fields, then click **OK**.

A table box containing the selected fields now appears on your screen. Size it until you see all the columns, and move it to an appropriate position.

As you see, the field values found in one and the same row are logically connected just like in a straight table.

Customer	Address	City	Country	Zip
Adder Inc.	9, rue de la Poste	Montreal	Canada	-
Adder Inc.	14 George Washington Avenue	San Francisco	U.S.A.	-
Al Akbar News Services	-	Kabul	Afghanistan	-
Alf Jequitaine	Rue de Gaulle 13	Paris	France	75664
Asian Pizza	-	Chittagong	Bangladesh	-
Asian Pizza	-	Thimpu	Bhutan	-
Asian Pizza	-	Rangoon	Burma	-
Asian Pizza	55, Han Kow St.	Taipei	Taiwan	-
Asian Pizza	-	San'a	Yemen	-
Atlantic Marketing	174, rue Duchamp	Liège	Belgium	-
Atlantic Marketing	Bahnhof Strasse 3	Berlin	Germany	749 33
Atlantic Marketing	Westkapelseweg 5	Arnhem	Netherlands	-

Figure 31. A table box containing the same information as the multi box created in the previous lesson.

Adjusting columns

The columns of the table box can be adjusted just like those of the other tables:

- 1 Place the cursor on one of the vertical lines, then drag.

To adjust the rightmost column, place the cursor as far to the right as you can, but within the border and the scroll bar.

To adjust all the columns, you could do the following:

- 1 Click on one of the columns with the right mouse button.
- 2 Choose **Fit Columns to Data** or **Equal Column Width** from the float menu.

Note The float menu (and the **Object** menu, which is equivalent to the float menu of the currently active object) of the table box has different appearances depending on whether you right-click on the title bar or on a field. Field-specific commands such as **Select Possible**, **Sort** etc. are either non-existent or dimmed when you right-click on the title bar of the table box.

Sorting the table box

Just like the straight table, the table box provides excellent possibilities for sorting.

- 1 Right-click on the column header of the column *Country*, then choose **Sort** from the float menu.

Customer is still the first column of the table box, but the values are now sorted according to the sort order of the field *Country*. Note how the sort indicator in the table header has changed position.

Since this sheet mainly contains customer information, it makes more sense to have the table sorted by customer, though.

- 2 Double-click the header of the column *Customer*.

The table is now again sorted according to the sort order of the field *Customer*.

The sort orders of the different fields can be set on the **Sort** page of the **Table Box Properties** dialog. Here you can also change the sort priority of the columns by means of the **Promote** and **Demote** buttons.

Printing a table box

Suppose you want to print a list of all the French customers.

- 1 Clear all previous selections by clicking **Clear** in the toolbar.
- 2 In the *Country* list box of the *Customers* sheet, select *France*. The table box now shows all the customers that have offices in France.
- 3 Click on the table box with the right mouse button, then choose **Print...**



The **Print** dialog opens.

- 4 Click **Print Preview** to have a look at the list over French customers. For more information about printing, see the *Reference Manual*.

It is also possible to choose the **Print...** command from the **Object** menu, from the **File** menu or from the toolbar.

- 5 Close the **Print** dialog.

Exporting values from a table box

Instead of printing the table box, you can export its contents to a file:

- 1 Click on the table box with the right mouse button, then choose **Export...** from the float menu.

In the dialog that opens, .qvo is preselected as type of file. This is a QlikView-specific type, which can be freely associated with any program, for example Excel.

- 2 Type *Customers in France.qvo* or something similar in the **File name** box.
- 3 Click **Save**.
- 4 You can now open the Explorer and double-click the .qvo file to open it with e.g. Excel..
- 5 Close Excel and go back to QlikView.

Using an input box

Sometimes there is a need to enter data interactively into the QlikView document. It is normally not possible to change data in the fields (list boxes etc.) interactively. However, QlikView has something called variables, which can be changed at any time. The typical way of entering data in a variable is through the **Input Box**.


Entering data in an input box

In this chapter we will use an input box to enter a forecasted sales increase and see the result in a chart.

- 1 Clear all selections.
- 2 Go to the *Geography* sheet. There you will find an input box and a text object.

Forecasted increase next year	
Increase%	= 10
- 3 Select the input box and the explanatory text object next to it. If you have forgotten how to do this, see “Selecting and moving several sheet objects simultaneously” on page 43.

Please enter a value for the forecasted sales increase next year.
- 4 Drag both objects to the *Sales* sheet tab.
- 5 Go to the *Sales* sheet. The input box and the text object should now be found on that sheet.
- 6 Double-click the icon to restore the minimized chart *Sales Forecast*.

	Sales Forecast
---	----------------
- 7 The chart *Sales Forecast* shows sales per year for all countries. When you select a country, the bar to the left shows the country’s sales for the year selected as “current year”. The bar to the right the sales for the following year.

The forecast is calculated by an expression based on the sales in the current year, increased with a percent factor in a variable called *Increase*.

This percent factor is the variable shown in the input box. It is currently set to 10 percent. Since we are optimistic about sales, we will now raise the forecast to 20 percent sales increase.

8 In the list box *Year*, select the value *2005* to make that the base year for your prognosis. In the list box *Country*, all countries marked as “possible” (white) have information for the year 2005 associated to them.

9 Select *Bulgaria* in the list box *Country*.

10 Click with the mouse in the area to the right of the "=" in the input box. The figure "10" will be marked. You are now in edit mode for the input box.



Forecasted increase next year		
Increase%	=	10

11 Type "20" and press ENTER.

The value of the variable has changed and the chart is recalculated. You can see how the *Next Year* bar grows higher.

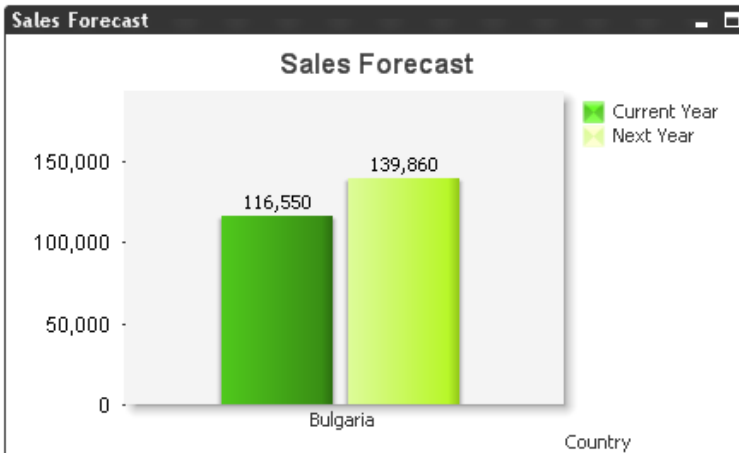


Figure 32. The sales forecast for Bulgaria

12 Minimize the chart.

Input box constraints.

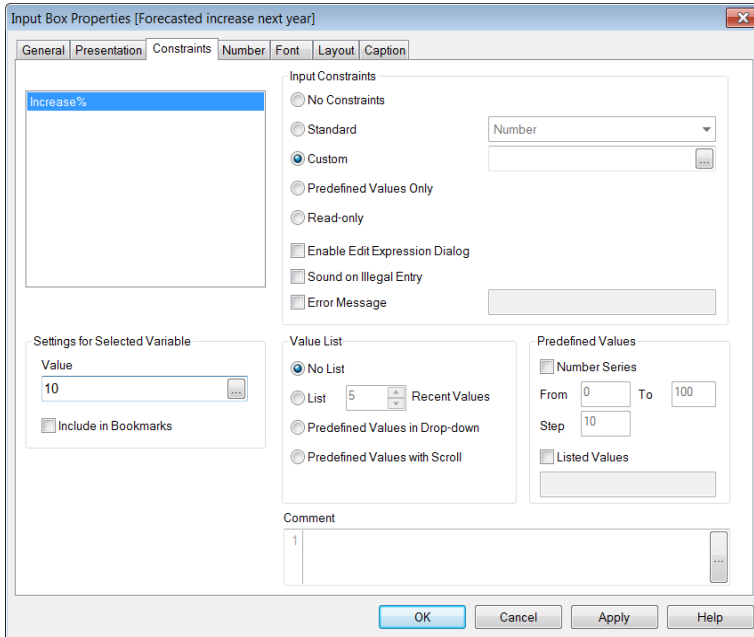


Figure 33. The Constraints page of the Input box properties dialog

In principle variables in input boxes can hold any data. The document designer often sets limits to what is allowed to enter. In the example in front of you a non-numeric value would not make sense, so this input box has a constraint only allowing input of numbers between -50 and 50. See the picture. Now try entering a value outside the constraints to see what happens.

1 Click inside the input box and enter the value "99". Press **Enter**.

The input box will not accept this value as it falls outside the set constraints.

You will remain in edit mode in the input box with the old value marked.

2 Type "10" and press ENTER and we are back where we started.

In the next lesson, you'll get acquainted with buttons, text objects and line/arrow objects.

Saving, closing and exiting

If you don't want to turn to the next lesson right away, you can close the document. You should also save the document, since the following lessons are based on the work you've done so far.

LESSON 8 **BUTTONS, TEXT OBJECTS AND LINE/ARROW OBJECTS**

In this lesson, you will learn how to create buttons, text objects and line/arrow objects. Buttons are used for carrying out commands in an easy way, or for exporting data. Text objects also have several areas of use; among other things, you can improve the appearance of your document by combining text objects of different colors to form backgrounds to sheet objects. Lines and arrows can be used to enhance the clarity of the document.

Opening the document

- 1 Start QlikView.
- 2 Open the file *MyTutorial.qvw*.

If *MyTutorial.qvw* is among the most recently used files, you can normally open it directly from the **start page**.

The button

Buttons can be used in QlikView to perform commands or actions, e.g. exporting data to files or launching other documents. Buttons can perform different types of actions, e.g. clear selections in a document, launch an external application or create a bookmark. You can read more about this in the *Reference Manual*.



Using a shortcut button


All the commands available for a shortcut button can also be performed in other ways in QlikView, but it is often very convenient to use a shortcut button. Shortcut buttons make it possible to perform commands quickly and easily. The *Geography* sheet contains a shortcut button with the text *Clear selections*.

- 1 Go to the *Geography* sheet.
- 2 Select one or several countries.
- 3 Click the shortcut button *Clear selections*.

Your selections have disappeared.

Creating a shortcut button

You will now create a similar shortcut button on the *Customers* sheet.

- 1 Click the **Create Button** icon in the toolbar. 
- 2 On the **General** page of the **New Button Object** dialog, type the text *Clear all selections* in the **Text** box.
- 3 Select a color via the **Color** button. **Aqua** is preselected for the button background. Keep it like that.
- 4 Go to the **Actions** page and click the **Add** button. This opens the **Add action** dialog.
- 5 In the **Selection** group, choose **Clear All**.

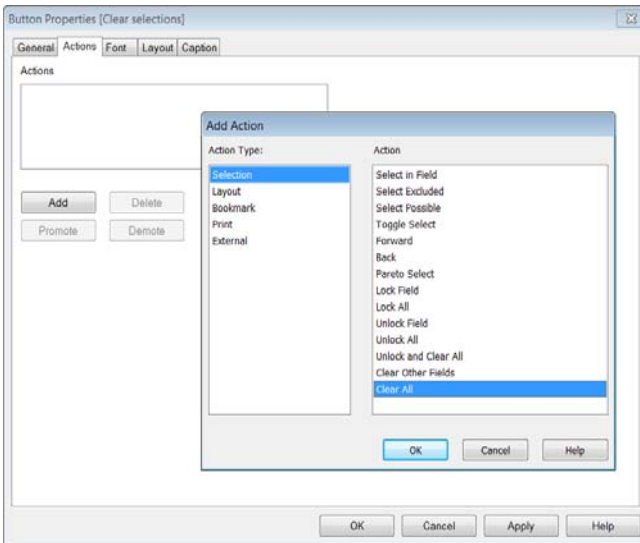



Figure 34. The Actions page of the New Button Object dialog with the Add Action dialog open.

- 6 Click **OK** to close the **Add Action** dialog.
- 7 Click **OK** to close the **Button Properties** dialog.
- 8 Try your new button.

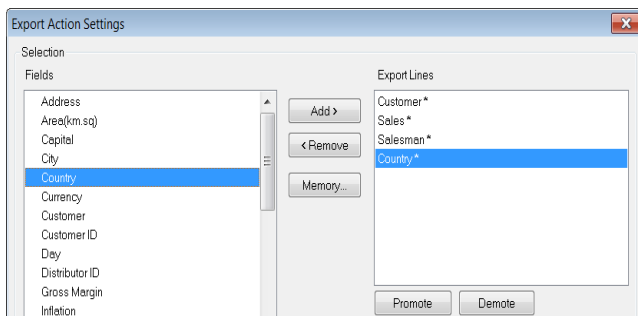
You can move the button by placing the cursor on it and dragging while holding the mouse button down.

Creating an Export button

You have already learned how to export data from a table box. It is also possible to use a button to export data from specific fields.

- 1 Go to the *Sales* sheet.
- 2 Click the **Create Button** icon in the toolbar. 
- 3 Type the text *Export* in the **Text** box.
- 4 Pick a color via the **Color** button. **Aqua** is preselected for the button background. Keep it that way.
- 5 Go to the **Actions** page and click the **Add** button to open the **Add Action** dialog.
- 6 From the **External** group, select **Export**.
- 7 Click **OK** to close the **Add Action** dialog.
- 8 Click **Setup** to open the **Export Action Settings** dialog.

The **Fields Selection** column in the **Selection** group contains a list of all the fields in the document. By double-clicking fields in this column, you add



them to the column **Export Lines**.

- 9 Add the fields *Country*, *Customer*, *Salesman*, *Sales*, and *Year* to the column **Export Lines**.
- 10 Click **OK** to close the **Export Action Settings** dialog, then click **OK** to close the **Button Properties** dialog.
- 11 Select a few values, then click the **Export** button.

The possible values in the specified fields have been copied to the clipboard. To see the result, open another software, for example Excel, and click **Paste**.

Exporting data to a file

You can also export the data to a file, like you did in the table box example:

-
- 1 Open the **Button Properties** dialog for the **Export** button again, and go to the **Actions** page.
 - 2 Click **Setup...** to open the **Export Action Settings** dialog.
 - 3 In the group named **Export to**, select **File** instead of **Clipboard**.
 - 4 The **Export File** dialog automatically opens. Type a file name in the **File name** box, e.g. *Export*.
 - 5 The export file should be placed in the same folder as your *Tutorial* file.
 - 6 Click **Save** to close the **Export File** dialog.
- The path to the file appears on the **Export Action Settings** page. Every time you click the export button, all combinations of the possible values of the specified fields will be copied to this file.
- 7 Click **OK** to close the **Export Action Settings** dialog, then **OK** again to close the **Button Properties** dialog.

Launching an export application

If you want the application to be launched as soon as you click the export button, you can specify this by creating a **Launch** action.

- 1 Right-click the **Export** button. Select **Properties**.
- 2 Go to the **Actions** page.
- 3 From the **External** group, select **Launch**.
- 4 Click **OK** to close the **Add Action** dialog. The **Actions** page now contains settings relevant for the **Launch** action.
- 5 Click the **Browse** button next to the **Application** box and browse to the software with which you want to open the export file. Choose Excel, which should be found under Program Files on your computer.
- 6 Click **Open**.
- 7 Click **OK** to close the **Button Properties** dialog.

Select a few values again, then click the *Export* button. If everything works as it should, Excel will now open the file *Export.csv*, containing your exported data.

- 8 Close Excel.
- 9 Clear your selections.

The text object

Text objects can be used in several different ways, e.g. for displaying explanatory text for the different parts of your document, or for creating multi-colored sheet backgrounds. In this section, you will create a multi-colored sheet background using text objects.

Setting a background using text objects

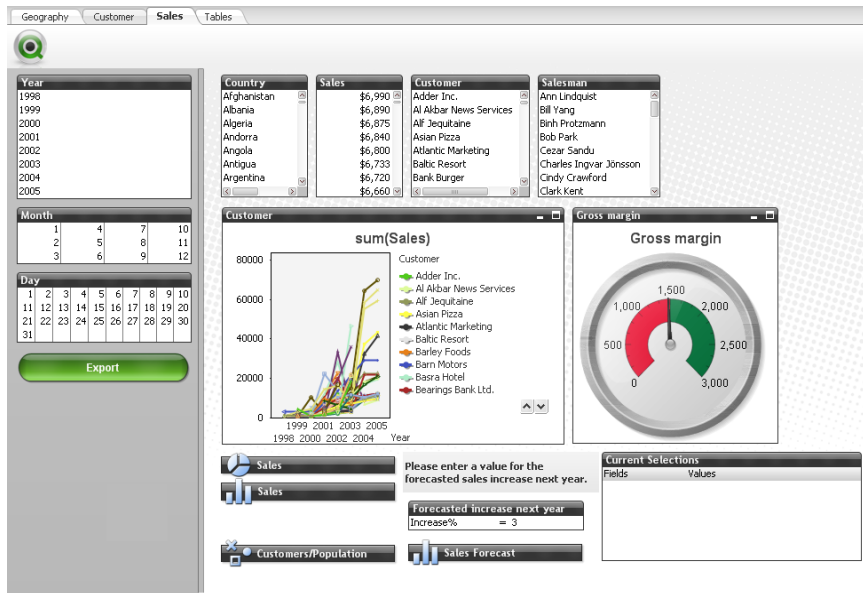


Figure 35. The new background of the sheet Sales

Suppose you would like to enhance the difference between the time-related boxes and the other information on the sheet *Sales*.

- 1 Go to the sheet Sales.
- 2 Click the **Create Text Object** button in the design toolbar.



The **New Text Object** dialog opens. The upper part of it contains an area in which you can type text. In this case the box should remain empty, since we only want color, not text.

- 3 Click the **Color** button. The dialog **Color Area** opens.
- 4 Click the **Base Color** button.
- 5 Pick a pale gray color from the map, then click **OK**.

- 6 **Solid Color** is preselected. Click **OK** to close all dialogs.
- 7 There should now be a small colored square somewhere on your sheet. This is your text object. You can move and size it freely.
- 8 Move and size the text object until it covers the left part of the sheet, including the list boxes *Day*, *Month* and *Year*. See the picture “The new background of the sheet Sales” on page 113.

Feel free to add colored text objects to the other sheets. Make sure that the text objects are positioned in the bottom layer (**Layout** page), so that they don't accidentally obscure other sheet objects.

The line/arrow object

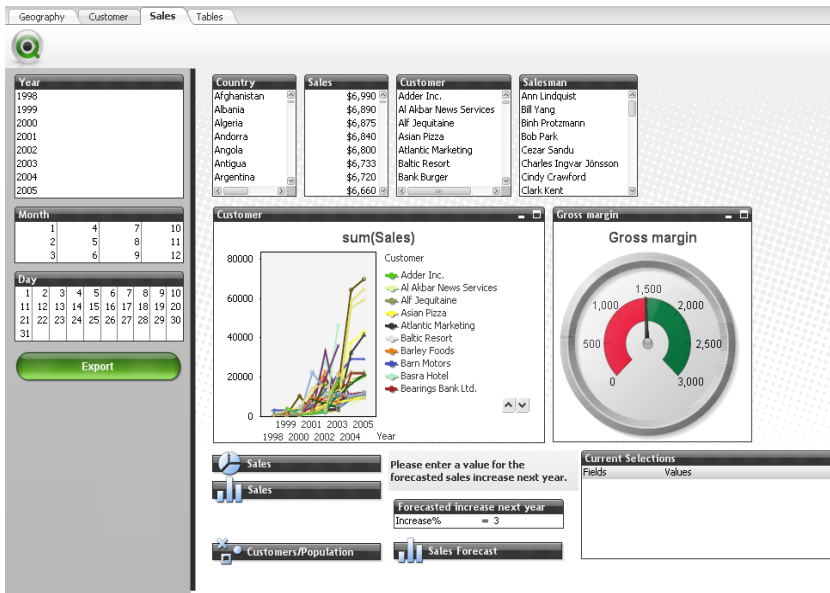


Figure 36. The line further enhances the division of the sheet.

Line/arrow objects can be used e.g. for dividing the sheet layout or for pointing out a certain sheet object etc. We will use a vertical line to emphasize the sectioning of the sheet established by the text object background we just created.

- 1 Go to the sheet *Sales*.
- 2 Click the **Create Line/Arrow** button in the design toolbar.



The **General** page of the **Line/Arrow Properties** dialog appears.

- 3 Choose **Vertical** orientation.
- 4 Click the **Color** button.
- 5 Choose a fixed dark gray color.
- 6 Click **OK** to close the **Color** dialog.
- 7 Choose a **Line Weight** of 5 and a continuous line as **Line Style**.
- 8 Choose line without arrow as **Arrow Style**.
- 9 Go to the **Layout** page. Choose **Layer - Bottom**.
- 10 Click **OK**.

A dark gray vertical line will now appear on the sheet.

- 11 Move the line with the mouse so that it borders the light gray background.

Setting a background color using the Sheet Properties dialog

There are other ways of applying a different background color to a sheet:

- 1 Click somewhere on the sheet *Customer* with the right mouse button and choose **Properties...**
- 2 On the **General** page of the **Sheet Properties** dialog, select **Sheet Settings** in the **Background** group, mark the **Color** check box and press the color button.
- 3 Pick a color from the color map, then click **OK** and close the properties dialog.

The *Customers* sheet now has a colored background that covers the entire sheet. It is also possible to use an image as a background. For more information about using background colors, adding images and creating layout themes, see the *Reference Manual*.

In the next chapter you get to create and use slider objects, current selection objects and bookmark objects

Saving, closing and exiting

If you don't want to turn to the next lesson right away, you can close the document. You should also save the document, since the following lessons are based on the work you've done so far.



LESSON 9 SLIDERS, CURRENT SELECTION OBJECTS AND BOOKMARK OBJECTS

This lesson features three additional types of sheet objects which can be used to make QlikView applications more user friendly. The slider/calendar object offers a graphical way of manipulating selections in a field or data in a variable. The current selections box and bookmark objects makes it possible to move menu functionality to a more visible position in the QlikView layout.

Opening the document

- 1 Start QlikView.
- 2 Open the file *MyTutorial.qvw*.

If *MyTutorial.qvw* is among the most recently used files, you can normally open it directly from the **start page**.

The slider/calendar object (in slider mode)

A slider allows you to make selections in fields or variables while showing the selection graphically. Slider objects are very versatile and useful. In this Tutorial we are only showing one of their possible uses: to connect a slider object to a field. For more information about sliders, and about the calendar mode of a slider/calendar object, see the *Reference Manual*

A slider consists of several parts that can all be formatted and defined. See the picture below.

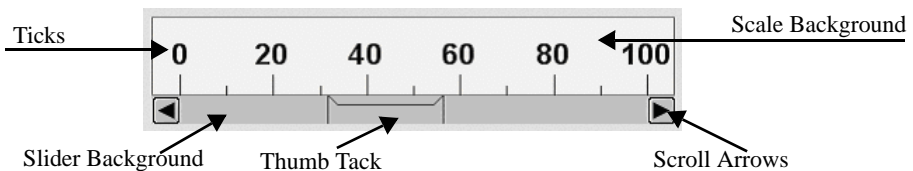



Figure 37. The components of a slider object

- 1 Go to the *Sales* sheet.

-
- 2 Clear your selections.
 - 3 Click the **Create Slider** button in the toolbar or right-click somewhere on the sheet and choose **New Sheet Object, Slider/Calendar Object...** 
 - 4 The **General** page of the **New Slider/Calendar Object** dialog box now appears. Slider objects can be used to control a field or one or two variables. In this example we will use it for controlling selections in the field *Month*.
 - 5 Choose *Month* in the **Field** drop-down box.
 - 6 Choose **Multi Value** in the **Mode** group.
 - 7 Choose **Discrete** in the **Value Mode** group.
 - 8 Go to the **Presentation** page. Choose **Use Custom Scale**. Use the arrows to select the following: **12 Major Units, Labels on Every 1 Major Unit** and **0 Minor Units per Major Unit**.
 - 9 On the same page, drag the slider for **Scale Background** to 0% transparency. On the pages **Presentation** and **Layout** you will be able to change the looks of your slider object later on.
 - 10 On the **Sort** page, select **Numeric Value (Ascending)**.
 - 11 On the **Layout** page, select **Use borders** and make them **Solid**.
 - 12 On the **Caption** page, mark the **Show Caption** check box and type *Month* in the **Title Text** box. Click **OK**.

The slider object appears on your sheet. In order to show the ticks, you may need to size the slider object by dragging its border.

- 13 Select months 7, 8 and 9 in the *Months* list box. A thumb appears in the slider object.

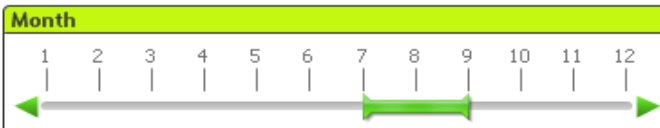



Figure 38. An example of a slider object

- 14 Point at the thumb, click and drag it. Note the pop-up showing the months corresponding to the current position of the thumb.
- 15 Release the mouse button. The selections in the list box will shift in line with the slider position.

- 16 Position the cursor on one of the slider thumb's short ends. Click and drag. The range of selections will narrow or widen accordingly.
- 17 Release the mouse button and the new selection takes effect.
- 18 Clear your selections. The thumb disappears from the slider object.
- 19 Put the cursor inside the slider area (between the arrows). The thumb will reappear.

Creating a Current Selections box

You learned about Current Selections boxes under “Selections” on page 28. This is how you create a Current Selections box:

- 1 Go to the *Customers* sheet.
- 2 Clear your selections.
- 3 Click the **Create Current Selections Box** button in the toolbar or choose **New Sheet Object, Current Selections Box...** from the **Layout** menu. 
- 4 The **General** page of the **New Current Selections Box** now appears. Leave the preselected options unchanged and click **OK**. The current selections box appears on the sheet.

Current Selections	
Fields	Values
Country	<input checked="" type="radio"/> Monaco
Customer	<input checked="" type="radio"/> Captain Cook's Surfing School

Figure 39. A Current Selections Box

- 5 Now select a few values in the fields. Note how your choices are reflected in the current selections box.
- 6 Clear your selections.


Creating a bookmark object

Under the **Bookmarks** menu, users can create and use personal bookmarks that are stored on their own computers as well as document bookmarks that are stored with the QlikView file (for more information about bookmarks, see the *Reference Manual*).

However, it is sometimes more convenient to be able to handle bookmarks directly in the QlikView document. This is why we have the bookmark object.

In a bookmark object you can select existing bookmarks from a drop-down list and, depending on configuration, add new and delete old bookmarks.

Let's create a bookmark object:

- 1 Go to the *Customers* sheet.
- 2 Clear your selections.
- 3 Click the **Create Bookmark Object** button in the toolbar or choose **New Sheet Object, Bookmark object...** from the **Layout** menu. 
- 4 The **General** page of the **New Bookmark Object** dialog box now appears. Type the title *Bookmarks* in the **Title** box. You do not need to change any other default settings.
- 5 Click **OK**.

The bookmark object now appears on your sheet.



Figure 40. An example of a bookmark object

- 6 Make a few selections in some list boxes and then click the **Add Bookmark** button in your new bookmark object.
- 7 Type a name for the new bookmark in the dialog that appears. Then click **OK**.
- 8 Clear your selections.
- 9 Select your bookmark in the drop-down list in the bookmark object.

In the last lesson of this part of the tutorial, you will learn how to change settings on document level, how to set user preferences and how to reload data.

Saving, closing and exiting

If you don't want to go on to the next lesson right away, you can close the document. You should also save the document, since the following lessons are based on the work you have done so far.

LESSON 10 DOCUMENT PROPERTIES, USER PREFERENCES AND RELOAD

In the previous lessons, you have been working with the different sheet objects; among other things, you have changed the appearance and behavior of the objects using their **Properties** dialogs. In this lesson, which is the final lesson of the part *Working with QlikView*, you'll learn how to change the properties of all the objects in the document at the same time.

Furthermore, some settings that affect not only the current document, but all the work performed in QlikView, will be introduced.

At the end of the lesson, you'll learn how to update your document, i.e. how to reload data from the data sources that contain the data shown in your QlikView document. You might say that this chapter is a stepping-stone to the next part of the Tutorial where you learn to create a document by loading data from different data sources.

Opening the document

- 1 Start QlikView.
- 2 Open the file *MyTutorial.qvw*.

If *MyTutorial.qvw* is among the most recently used files, you can normally open it directly from the **start page**.

Setting Document Properties

Until now, you have been changing the properties of individual sheet objects. However, you will often find yourself in a situation where you would like to give the same appearance to all the sheet objects of the document or format several fields at the same time. You might want to set background colors for all the sheets in the document. This is when the **Document Properties** dialog is useful. You can also use this dialog to attribute an opening sound or an opening picture to your document.

Setting an opening picture and an opening sound

On the **Opening** page, you can further improve your document by choosing a picture and/or a sound to be shown or played, respectively, when the document is opened:

- 1 Go to **Settings - Document Properties**. Go to the **Opening** page.

-
- 2 Check-mark the check box **Image**.
 - 3 Click **Select**.
 - 4 Browse to the file *Opening.bmp*. It is located in the same folder as your Tutorial file.
 - 5 Click **Open**.
 - 6 Check-mark **Close After 5 Seconds**.
 - 7 Check-mark the option **Sound**, then click **Select**.
 - 8 Browse to the file *tada.wav*. It is located in the same folder as your Tutorial file.
 - 9 Click **Open**. Use the **Play** button to play the sound.
 - 10 Click **OK**.
 - 11 Save the document.

Setting properties

Several of the pages in the **Document Properties** dialog contain settings similar to those of the **List Box Properties** dialog. The difference is that when you change the settings in the **Document Properties** dialog, all the sheet objects containing the selected field are affected. The settings are either applied immediately or only on new sheet objects that are created after the changes were made. This is described in more detail in the *Reference Manual*.

Sorting all future list boxes containing the field Area

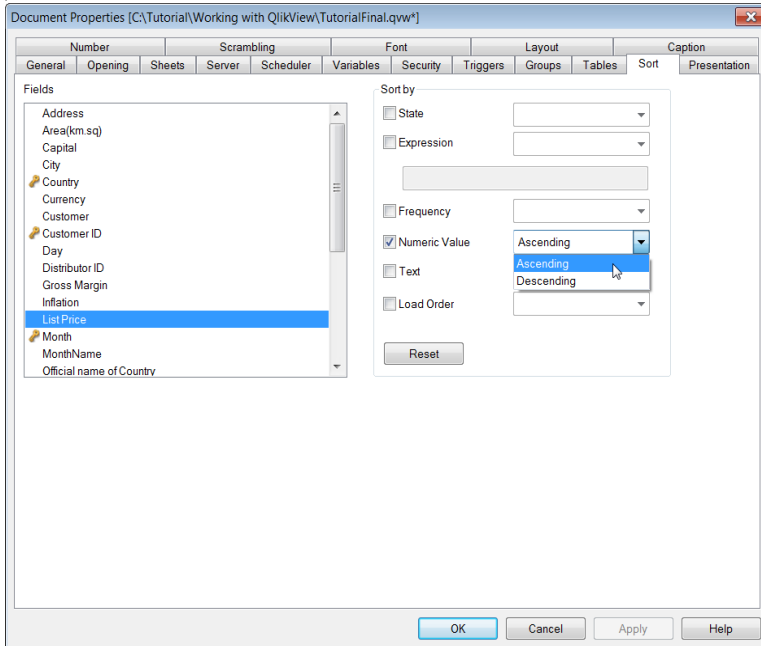


Figure 41. The Sort page of the Document properties dialog.

- 1 Choose **Document Properties** from the **Settings** menu.
- 2 Go to the **Sort** page.

You recognize the sort options from the **List Box Properties** dialog. The **Fields** box on the left contains a list of all the fields in the document. Here you can select one or several fields to set their sort order:

- 3 Select *Area(km.sq)*.

Suppose you want the field sorted by numeric value, descending:

- 4 Select **Numeric Value**, then **Descending**.
- 5 Click **OK**.
- 6 Create a new list box containing the field *Area(km.sq)* and note its sort order.
- 7 Delete the new list box.

Applying the same border settings to all the sheet objects

The **Layout** page of the **Document Properties** dialog is identical with the corresponding page in the **List Box Properties** dialog. However, a setting changed here will affect the entire document. Let us give objects (except buttons, text objects and line/arrow objects) a walled border with slightly rounded corners.

- 1 Go to **Settings - Document Properties**.
- 2 Go to the **Layout** page.
- 3 Check **Use Borders** if it is not preselected yet.
- 4 Pick a border style and width.
- 5 In the **Apply to** list, select all objects except buttons, text objects and line/arrow.
- 6 Click **OK**.

The change is implemented throughout the entire document.

- 7 Undo this change using the **Undo Layout** button.
- 8 Save the document.



Themes

Another even quicker way of applying changes to an entire document is by creating and applying a QlikView theme. You will learn about themes in “Creating a theme” on page 141. For more information about themes and document properties, please refer to the *Reference manual*.

User Preferences

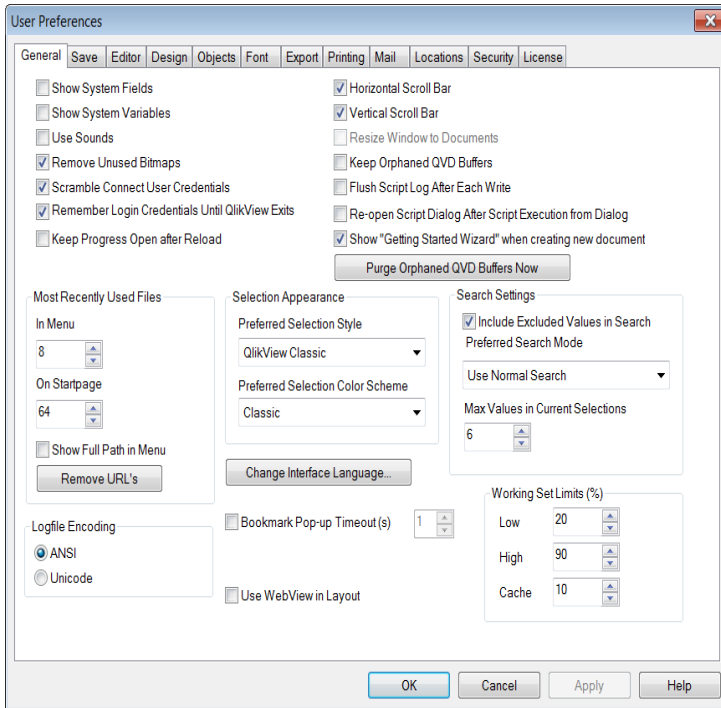


Figure 42. The User Preferences dialog

The **User Preferences** dialog, found in the **Settings** menu, contains a number of settings concerning your way of working with QlikView. Settings changed here remain the same regardless of the application you work with. One example is the language of the QlikView interface that you can change here.

Take a few minutes to browse through the settings in the **User Preferences** dialog. For more information on the available commands, see the *Reference Manual*.

Reloading data

The procedure of loading data into QlikView is beyond the scope of this first part of the *Tutorial*. However, even if you will not build your own documents, knowing how to reload, i.e. update, the data contained in the document is of great importance. This is done in a very easy way:

-
- 1 Click the **Reload** button in the toolbar (or choose **Reload** from the **File** menu).



If the source data has changed, all your sheet objects are instantly updated to reflect the changes (in this case, no new data has been added). QlikView thus offers an extremely easy way of keeping your document up to date.

You have now come to the end of the part *Working with QlikView*. If you are going to build your own documents, or if you are just curious to find out how the data you worked with can be presented in QlikView, you should continue with the following part.

Saving, closing and exiting

- 1 **Save** and close the file.

Checking your work

The folder *Working with QlikView* contains a file called *TutorialFinal*. If you want to, you can open this file to compare it with the one you just saved.

CREATING A DOCUMENT

- Loading data into QlikView
- Layout themes
- Associating data from several tables
- Concatenating tables
- Linking information
- Loading data via OLE DB



Introduction

In the previous part of the *Tutorial*, you learned how to work with an existing application. The document already contained data that you displayed in list boxes and other sheet objects.

In this second part, you will learn how to create a QlikView document from scratch. Loading data and associating data tables are two of the main topics to be treated. Like in the previous part, there will be a step-by-step presentation of the procedures.

When you start creating documents of your own, you may want to use the Getting Started Wizard (under **User Preferences, General, Show Getting Started Wizard when creating new document**). This wizard helps new users load data into QlikView without opening the **Edit script** dialog. As the exercises in this part of the Tutorial aim to educate users about scripting, you will not use the wizard here.

The source data files used in this part are found in the `..\Tutorial\Application\Data Sources` directory. The sample represents a customer database of a fictive company.



LESSON 11 LOADING DATA INTO QLIKVIEW

A QlikView document is created by retrieving data from one or several sources, e.g. from a relational database or from text files containing data tables. This retrieval is done by writing and executing a script, in which the database, the tables and the fields to be retrieved are specified. The script can be generated automatically with the tools included in QlikView. Note that QlikView in itself is not a traditional database, i.e. you cannot add or alter data in the source database.

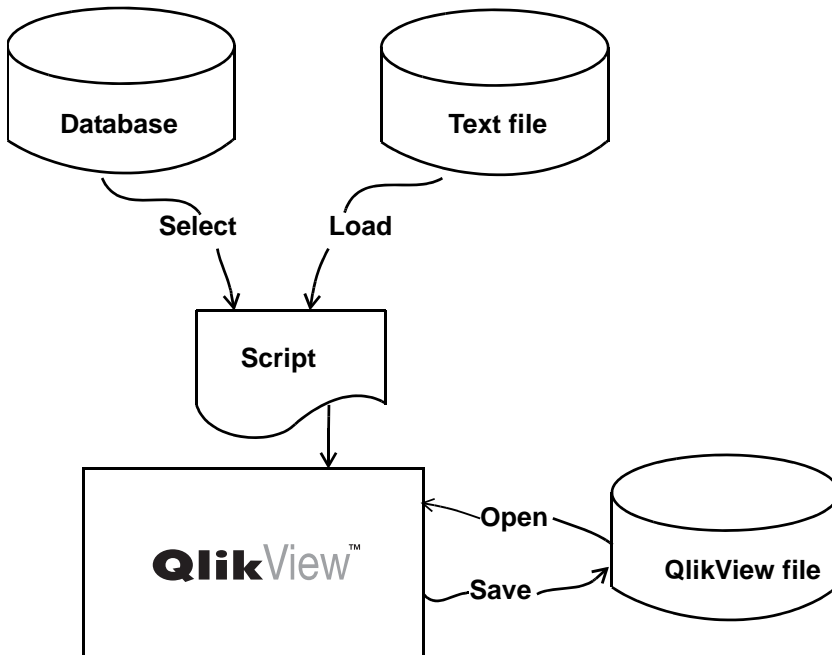


Figure 43. Data can be imported from text files, or from databases via the ODBC or OLEDB interface. The imported data, together with the made layout, can be saved as a QlikView document.

In this lesson, you'll create a simple document consisting of one data table.

Looking at a delimited text file

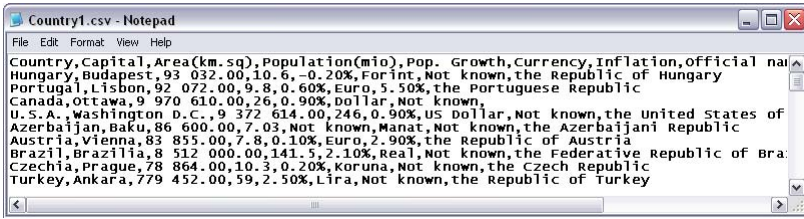


Figure 44. One representation of a table - a comma separated file viewed in a simple text editor.

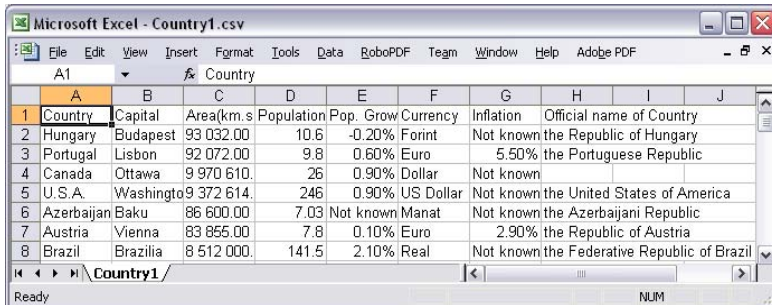
The simplest way to store a data table is in a text file. In this type of file, each record is represented by a row, and the fields (columns) are separated by characters, e.g. commas (or semicolons, tabs, etc.). Field names are preferably stored in the first row. The type of file that will be used in the examples is the csv (comma separated value) file, which uses comma as delimiter. You'll start by looking at a csv file in a text editor:

- 1 Start a text editor, e.g. **Notepad** (found in the Windows **Accessories** group).
- 2 Open the file *Country1.csv* from the `..\Tutorial\Application\Data Sources` directory (choose **All Files** in the **Files of Type** box).

It should look similar to the file in Figure 44. The contents of the file are logically a table, where each row, or record, describes a country and its properties. The columns are separated by commas, and the first line contains the column (field) names.

- 3 Close the text editor.

Comma separated value files and text files with other delimiters, such as tab or semi-colon, can often be imported to, and exported from, spreadsheet programs. In such a program (e.g. Excel) the same file looks like the one in Figure 45. If you have a spreadsheet program, it might be easier to work in this than in a text editor when creating the tables.




	A	B	C	D	E	F	G	H	I	J
1	Country	Capital	Area(km.s	Population	Pop. Grow	Currency	Inflation	Official name of Country		
2	Hungary	Budapest	93 032.00	10.6	-0.20%	Forint	Not known	the Republic of Hungary		
3	Portugal	Lisbon	92 072.00	9.8	0.60%	Euro	5.50%	the Portuguese Republic		
4	Canada	Ottawa	9 970 610.	26	0.90%	Dollar	Not known			
5	U. S. A.	Washington	9 372 614.	246	0.90%	US Dollar	Not known	the United States of America		
6	Azerbaijan	Baku	86 600.00	7.03	Not known	Manat	Not known	the Azerbaijani Republic		
7	Austria	Vienna	83 855.00	7.8	0.10%	Euro	2.90%	the Republic of Austria		
8	Brazil	Brazilia	8 512 000.	141.5	2.10%	Real	Not known	the Federative Republic of Brazil		

Figure 45. The comma separated file viewed in a spreadsheet program.


Creating a new QlikView document

The first thing to do before loading a file into QlikView is to create an empty document.

- 1 Start QlikView (see the *Basics* chapter if you have forgotten).
- 2 Choose **New** from the **File** menu or from the toolbar. The Getting started wizard opens, but you will not use it for this exercise.  Uncheck **Show this wizard when creating new documents** at the bottom of the page and close the wizard.
- 3 Save the QlikView file in the `..\Tutorial\Application` folder. Name it something like `MyDocument.qvw`.

Loading a text file into QlikView

The next thing to do is to create a script that specifies the files to load:

- 4 Choose **Edit Script** from the **File** menu or from the toolbar. 

The **Edit Script** dialog now opens. It is in this dialog that the script will be created. A number of rows starting with **SET** have already been generated in the script pane to the upper right. You will learn about their meaning later (*Advanced Features*

page 209). Each statement is represented by a box in the statement graph pane to the left. At the bottom of the dialog you will find a row of tabs containing functions for script generation.

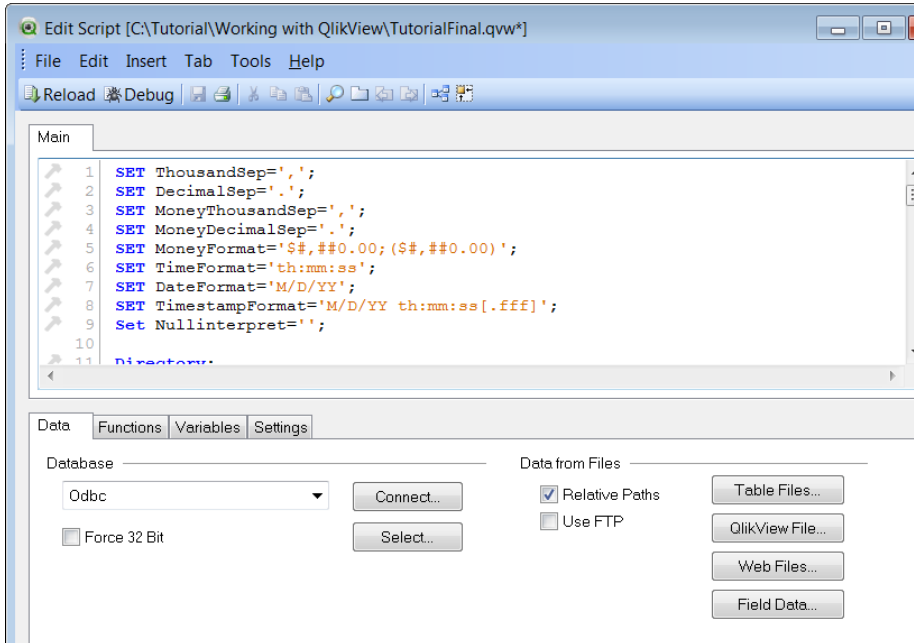


Figure 46. The Edit Script dialog

- 5 Make sure that the check box **Relative Paths** is checked.
- 6 Choose **Table Files** on the **Data** tab. This opens the **Open Local Files** dialog box, in which you can browse for the file you wish to load. Make sure that the control **Files of Type:** is set to **All Table Files**.
- 7 Find the file *Country1.csv* (the one you opened in the text editor before), select it and choose **Open**. The file is now opened in the **File Wizard**, which interprets the contents of the file and helps you to load the data into the script in a correct way.

The file wizard interprets the file to be a comma separated (delimited) file using the ANSI(Western European) character set. This is a correct interpretation. The wizard also states that the header size is **none**, which means that the file contains no initial information to be omitted.

You want to use the field names *Country*, *Capital* etc. as labels, or headings, in your file.

8

In the **Labels** drop-down, select **Embedded Labels**. The field names move to the top row, marked gray. See “Interpretation of the file Country1.csv in the file wizard” on page 135.

9 Since the program has made a correct interpretation of the file, you can click **Finish**.

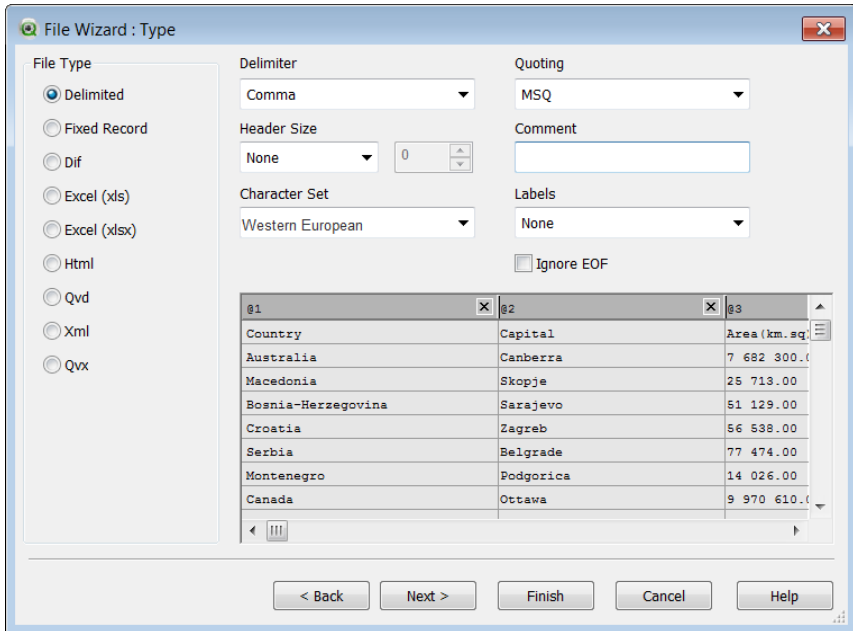


Figure 47. Interpretation of the file Country1.csv in the file wizard

10 A script similar to the one below has been generated in the **Edit Script** dialog:

```
Directory;
Load Country,
    Capital,
    [Area(km.sq)],
    [Population(mio)],
    [Pop. Growth],
    Currency,
    Inflation,
    [Official name of Country]
FROM [Data Sources\Country2.csv] (txt, codepage is
1252, embedded labels, delimiter is ',', msq);
```

Study the script. Note that the words **set**, **load** and **from** are highlighted. This means that they are keywords, i.e. have a special meaning in the QlikView script. You can change the colors by choosing **Configure** from the **Settings** menu (of the **Edit Script** dialog). For further details, see the *Reference Manual*.

After **load**, the fields of the selected file are listed. Some of the field names are enclosed by square brackets; this is necessary when a field name contains spaces. The word **FROM** is followed by the path to the file. In the Tutorial we use relative paths, which means the script will show the location (folder) and the file name, *Country1.csv*. See “Relative paths and absolute paths” on page 139.

The final parenthesis contains additional information about the file, specifying, among other things:

- Character set: the character set used ANSI, or Windows 1252
- File type: txt, biff/xls etcetera
- Delimiter: semicolon, comma or tab are examples of characters separating the field value
- Embedded labels: the first row of the file contains field names (column headings). If there are no embedded labels, placeholders will be used as headings instead.

You recognize these terms from the file wizard.

Note It is a good habit to always save your changes to the script (still in the **Edit Script** dialog) before you try to reload it. That way you can easily go back and make changes if the reload should not be successful. A useful general setting is to mark the check box **Save before**



Reload in the **User Preferences** dialog. This means that all your QlikView documents are automatically saved just before the script is reloaded.

Note

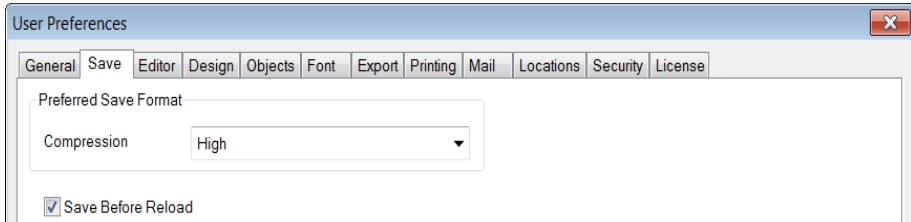


Figure 48. The *Save Before Reload* setting is recommended.

- 11 Choose **Reload**.
- 12 The data is now loaded into QlikView, and a dialog box in which it is possible to select the fields to be displayed (Figure 49) is opened.
- 13 Select the fields *Area (km.sq.)*, *Capital*, *Currency* and *Population(mio)* by CTRL-clicking their names, then choose **Add>** to include them in the list of displayed fields. Another possibility is to double-click the field names. This



will immediately put them in the list of displayed fields. The field names starting by "\$" are system fields (they are only shown if the check box **Show System Fields** is selected). You'll learn about them later (page 179).

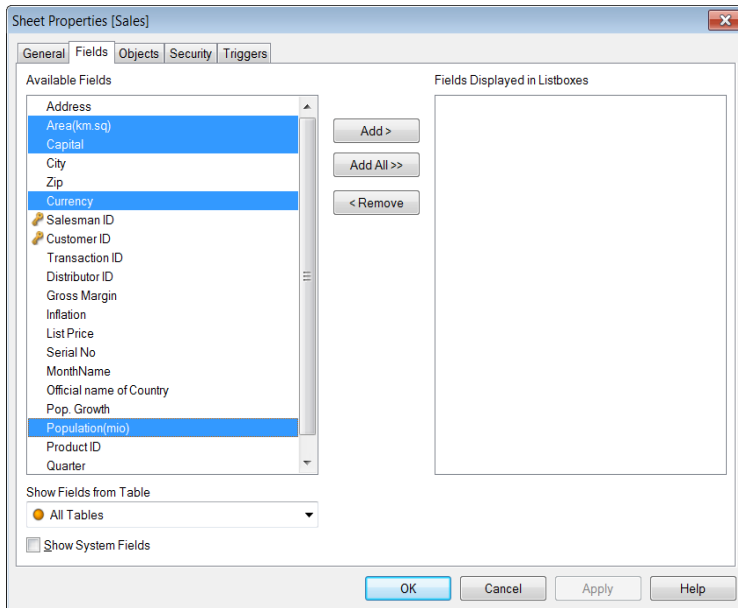


Figure 49. The Fields page in the Sheet Properties dialog. Here you select the fields to display on the current sheet.

- 14 Choose **OK** to close the dialog. All the fields in the column **Fields Displayed in Listboxes** will be displayed as list boxes on the active QlikView sheet.

If you want to add or remove fields, you can open the **Sheet Properties** dialog again at any time. This is done by clicking on the sheet with the right mouse button and choosing **Properties** from the float menu.

If you have followed all the steps correctly, you should now have a display similar to the one shown in “A simple QlikView document” on page 139 This document is ready to be used, although the layout can be improved.

- 15 Click on a capital, and you will find information connected to it in the other listboxes, for example the currency used in that country. Note that all the information refers to the countries, since every record in the table that was loaded represents a country. Thus, clicking on Paris does not mean that you get the population of Paris. It is still the population of France that is shown.

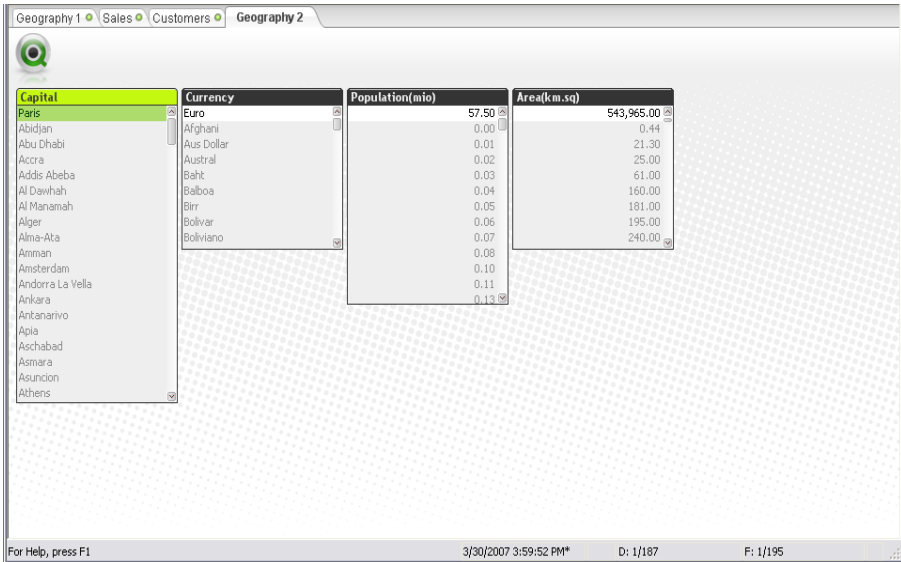


Figure 50. A simple QlikView document

- 16 Clear your selections.

Relative paths and absolute paths

In the Tutorial we use relative paths, meaning that QlikView will look for files relative to the directory where the current QlikView document is stored.

To use relative paths, mark the checkbox **Relative Paths** in the **Edit Script** dialog. It is also possible to edit a path directly in the script.

An example of a relative path:

```
..\Application\Data Sources.
```

A statement using a relative path is preceded by a *directory* statement in the QlikView script. Learn more about the *directory* statement in the *Reference Manual*.

Data from Files

Relative Paths

Use FTP

Table Files...

QlikView File...

Web Files...

Field Data...

An absolute path, on the other hand, gives an exact specification of the location of the file. If you move the file to another location (e.g. to a user directory or to another hard disk), the program will no longer be able to find related files and run the script.

An example of an absolute path:

```
C:\Documents and Settings\Desktop\Application\Data Sources
```

Saving, closing and exiting

You have now created a simple QlikView document, consisting of a single table. In the next lesson, you will learn how to improve its layout using a layout theme that you create yourself.

If you don't want to turn to the next lesson right away, you can close the document. You should also save the document, since the following lessons are based on the work you've done so far.

LESSON 12 LAYOUT THEMES

Themes are very useful because you only need to create a layout once, then copy it to any new documents that you create. The basic idea is to “extract” layout settings from an existing QlikView document to a theme file, and then apply the same settings to the new document.

Creating a theme

You will now create a very basic layout theme containing layout settings for the sheet background and listboxes. The file *Tutorial.qvw* that you used in the first part of the Tutorial contains all the layout settings that you need for your new document: a gray sheet background with a logotype, and dark gray captions.

- 1 Open the file *Tutorial.qvw*. You find it in the folder *Working with QlikView*. If you used it recently, you can also start it from the start page.
- 2 Go to **Layout - Theme Maker Wizard**.
- 3 Click **Next >** to go to **Step 1 - Select theme file**.
- 4 Make sure that **New Theme** is selected and click **Next >**. The **Save As** dialog opens.
- 5 Name the theme file *MyTheme.qvt* and save it in the *..\Tutorial\Application* folder.

- 6 In **Step 2 - Source selection**, in the drop-down list **Source**, select *Sheet DocumentSH01 - Geography*. The **Object Type Specific** check box is preselected. Leave it that way. Click **Next >**.

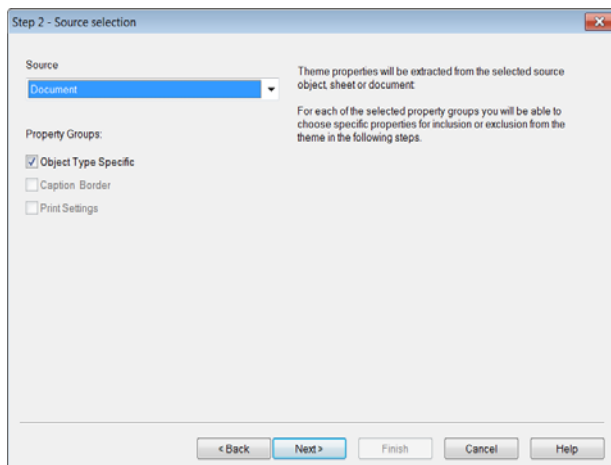


Figure 51. The Theme Maker Wizard

- 7 Mark the checkboxes **Sheet Background** and **Sheet Tab**. Deselect all other checkboxes. Click **Next >** to reach the final page.
- 8 Click **Finish** to save the theme and close the dialog.

You have now created a very basic theme containing the sheet background settings. Now you want to add green and gray captions for relevant sheet objects to the theme.

- 9 Still in the *Tutorial.qvw* document, open the **Theme Maker Wizard** again. Go to **Step 1 - Select theme file** and open your theme from the *Application* folder where you saved it.
- 10 Go to **Step 2 - Source Selection**.
- 11 Under **Source**, select a list box with the correct caption color. In this case you pick the list box *Country*. Mark the check boxes **Object Type Specific** and **Caption & Border**. Click **Next >**. The layout settings from the list box are now added to the theme.

- 12 Click **Next >** several times until you reach Step 4 - **Insertion of properties in theme**. Here you mark checkboxes to select what objects the caption and border settings should apply to. It is a good idea not to include buttons, text objects and line/arrow objects in the theme - you might want a different layout for those.
- 13 Click **Next >** to reach the last page of the wizard.
- 14 Mark the check box **Set as default theme for this document** and click **Finish**.
- 15 You have now finished creating the theme. Close the file *Tutorial.qvw*.

Applying a theme to a document

- 1 Open the file *MyApplication.qvw* that you created in the previous section of the Tutorial.
- 2 Go to **Settings - Document Properties**, then go to the **Layout** page of that dialog.
- 3 Click **Apply Theme...** and browse to your theme, called *MyTheme.qvt*. Click **Open**. The theme is now applied to your document: the QlikView logotype appears, and the captions of all list boxes turn dark gray (or green if they are active).

You can go back and make modifications to your theme at any time. You may also want to add layout properties for other sheet objects, such as buttons. You can apply the theme to your document as often as you like. For more information about themes, please refer to the *Reference Manual*.

Saving, closing and exiting

You have now created a simple QlikView document, consisting of a single table. In the next lesson, you'll add two more tables and learn about QlikView's powerful capability of associating tables.

If you don't want to turn to the next lesson right away, you can close the document. You should also save the document, since the following lessons are based on the work you've done so far.



LESSON 13 ASSOCIATING DATA FROM MANY TABLES

Previously, under “Creating a new QlikView document” on page 133, you created a basic document by loading one table into QlikView. However, what you usually want to do is to load and associate data from a great number of tables. In this lesson you will be familiarized with QlikView’s way of automatically associating related tables. You will also learn how to rename fields in order to assure or prevent associations.

Associations

If you have two tables listing different things, e.g. if you have one list of customers and one list of invoices, and the two tables have a field (column) in common, e.g. the customer number, this usually means that there is a relationship between the two tables.

If such a relationship exists, associations are made between the fields that are common to the tables: QlikView assumes that the two fields are one and the same thing, and the two fields are treated as one. Such a field connecting two or more tables is called a *key*.

There are two basic rules for associations:

- For two fields to be associated, they need to have the exact same name (case sensitive). Thus, *Name* and *name* are not the same and will not be associated.
- If a certain field has the exact same value in several different input tables, QlikView will treat it as one value and also assume that the records (rows) containing the value should be associated. For two field values to be associated, they either need to
 - have exactly the same spelling (case sensitive), or
 - have exactly the same numeric value

Thus: *Name* and *name* are not the same and are not associated. The numbers *123* and *00123* are the same and are associated.

For a further illustration of the basic rules, study the following example:

Table 1:	Table 2:	Table 3:
Name Number	Number Age	Name ID
John 1	3 28	Phil ab
Phil 2	4 35	john xy
Betty 5	2 42	

Figure 52.

The fields named *Number* are assumed to be one and the same according to the first rule. Table 1 and Table 2 are associated via this field. Table 1 and Table 3 are associated in the same way via the field *Name*.

The field *Number* has the value 2 in both Table 1 and Table 2, which means that *Phil* is assumed to be associated with the age 42.

The value 2 in Table 1 is associated with the value *ab* in the field *ID* in Table 3 via the value *Phil* of the field *Name*. *John* in Table 1, however, is not the same as *john* in Table 3, so there will be no association.

Table 1:	Table 2:	Table 3:
Name Number	Number Age	Name ID
John 1	3 28	Phil ab
Phil 2	4 35	john xy
Betty 5	2 42	

Figure 53.

An association thus means that links are built between the fields in the tables, so that logical connections can be studied. This way several tables from one or several databases can be included in the QlikView logic simultaneously.

Opening the document

If you closed the document and exited QlikView after the previous lesson, you need to open it again.

- 1 Start QlikView.

- 2 Open the file created in the previous lesson (*MyApplication.qvw* or something similar).

Loading and associating a second table

Your document contains a table with country-specific information. In this lesson, you'll load an additional table representing a list of customers. The country table and the customer table will be associated through the common field *Country*. The customers being registered in different countries, the relation between country properties and customer can be studied as a result of the association.

The new table is found in an Excel file, but you can load it in the same easy way as a text file.

- 1 Choose **Edit Script** from the **File** menu or from the toolbar.
- 2 Place the cursor at the end of the script.
- 3 Click **Table files**.
- 4 Select *Customer.xls* from the *..Tutorial\Application\Data Sources* directory and choose **Open**. This opens the file wizard ("Interpretation of the file Country1.csv in the file wizard" on page 135).
- 5 Note that **Excel (xls)** is set as the file type this time, and that the **Tables** box contains the name of the worksheet. This Excel document contains only one worksheet; if there had been several sheets or named tables, the **Tables** box

would have made it possible to choose from which one of them data should be retrieved. Click **Finish**. Your script will now look similar to the one below:

```
Directory;
Load Country,
    Capital,
    [Area(km.sq)],
    [Population(mio)],
    [Pop. Growth],
    Currency,
    Inflation,
    [Official name of Country]
FROM [Data Sources\Country1.csv] (txt, codepage is
1252, embedded labels, delimiter is ',', msq); );

Directory;
Load [Customer ID],
    Customer,
    Address,
    City,
    Zip,
    Country
FROM [Data Sources\CUSTOMER.xls] (biff, embedded
labels, table is [CUSTOMER$]);
```

Study the script. You see that both *Country1.csv* and *Customer.xls* contain a field named *Country*. According to the association rules described above, QlikView will associate the two tables via this field.

- 6 Choose **Reload**.
- 7 The dialog in which you choose the fields to display now appears. All fields, except the field *Country* from the file *Customer.xls* have been added to the column of available fields. The field *Country* is shown in the list of available fields. The field *Country* has been associated with the previously loaded fields with the same fieldname.
- 8 Add the fields *Customer* and *Country* to the column of displayed fields.
- 9 Choose **OK**.
- 10 Save your document.



It is now possible to click on a capital and find the customers that reside in the country of this capital; at the same time, they are found in the customer register. This is possible although the fields *Customer* and *Capital* are found in different tables. The only prerequisite is that there is a field, *Country*, common to both tables.

- 11 Click *Astana*, the capital of Kazakhstan, and note that the fictive company has two customers in Kazakhstan.
- 12 Clear your selections.

You have now built a simple QlikView document containing data from two tables. Several tables can be linked (associated) this way, which makes it possible to study complex relationships in data from many tables.

Renaming fields

In the previous section, you learned that associations between tables are made via fields that are common to the tables, so called *keys*. As we have seen, the criterion for two fields to be associated (to be treated as one and the same field) is that they have the same name.

It thus becomes clear that field names are of great importance, and that the renaming of fields is a common procedure when building the QlikView data structure: in real life, fields that should be associated do not always have exactly the same name in different tables. Furthermore, fields that you do not want to associate might have the same name. Renaming fields in order to stop or create associations is an important part of creating a QlikView document.

The directory contains additional files (tables) that are relevant to your document. Suppose you want to associate the file *Transact.csv*, a file containing information about transactions, sales, etc. concerning the customers in the document:

- 1 Choose **Edit Script** from the **File** menu or from the toolbar.
- 2 Place the cursor at the end of the script.
- 3 Choose **Table Files**.
- 4 Select *Transact.csv* and choose **Open**. This opens the **File Wizard** (see “Interpretation of the file Country1.csv in the file wizard” on page 135).
- 5 Make sure that **Delimited** is set as type, **Comma** as delimiter and that **Embedded Labels** is selected.

Until now, you have only accepted the settings proposed to you by the file wizard. Now we will make use of some of the possibilities to change the way QlikView reads the data files.

In the file *Customer.xls* that we loaded before, there was a field named *Customer ID*. Note that the new file contains a field named *ID Customer*. These two fields should be associated, i.e. treated as one. To make this happen, however, you need to rename one of the fields.

-
- 6 The file wizard provides excellent possibilities for renaming fields. Simply click in the table header of *ID Customer*, then type the new name, *Customer ID*. Make sure not to forget the space between the words: any misspelling prevents QlikView from interpreting the fields as being one and the same.
 - 7 Press ENTER. The name of the field has been changed.
 - 8 Click **Finish**.

The automatically generated script looks similar to the one below:

```
Directory;
Load Country,
    Capital,
    [Area (km.sq)],
    [Population(mio)],
    [Pop. Growth],
    Currency,
    Inflation,
    [Official name of Country]
FROM [Data Sources\Country1.csv] ((txt, codepage is
1252, embedded labels, delimiter is ',', msg); );
```

```
Directory;
Load [Customer ID],
    Customer,
    Address,
    City,
    Zip,
    Country
FROM [Data Sources\CUSTOMER.xls] (biff, embedded
labels, table is [CUSTOMER$]);
```

```
Directory;
Load [Transaction ID],
    Year,
    Month,
    Day,
    [Salesman ID],
    [Product ID],
    [Serial No],
    [ID Customer] as [Customer ID],
    [List Price],
    Sales,
    [Gross Margin]
FROM [Data Sources\TRANSACTION.CSV] ((txt, codepage is
1252, embedded labels, delimiter is ',', msg); );
```

Note the line *[ID Customer] as [Customer ID]*: it has appeared as a result of the change you made in the file wizard, and means that the field *ID Customer* will be loaded into QlikView with the name *Customer ID* (thus assuring the necessary association).

- 9 Choose **Reload**.
- 10 The **Fields** page of the **Sheet Properties** dialog appears. Add a field from the file *Transact.csv* to the column of displayed fields, e.g. *Sales*.
- 11 Click **OK**.
- 12 Save your document.



Three different tables have been loaded, containing information about countries, customers and transactions, respectively. By associating the tables in the way described, QlikView allows you to find all the relevant information from all the tables at the same time - by means of a single click.

- 13 Select *Finland* in the list box *Country*. The program immediately provides the geographical data stored in the country tables - but also displays the names of the customers residing in Finland, as well as the sales values related to them.
- 14 Clear your selections.

Note It is easy to associate tables in QlikView, and it is possible to link fields and tables that should not be linked. If this is done, QlikView will not give you relevant answers. Think carefully before assigning field names to fields of different tables, thereby defining the associations.

You should now have acquired some basic knowledge about loading and associating tables. In the following lesson, you'll learn how to merge tables containing the same type of information.

Saving, closing and exiting

If you don't want to turn to the next lesson right away, you can close the document. You should also save the document, since the following lessons are based on the work you've done so far.



LESSON 14 CONCATENATING TABLES

In the previous lessons, you learned to load data into QlikView and to associate different tables that have fields in common. However, instead of being associated, tables can also be merged. If two input tables are lists of the same thing, but contain different values, e.g. if one is a list of countries in Europe and the other one a list of countries in North and South America, the second table can be seen as a continuation of the first. The tables should then be *concatenated*.

Opening the document

If you closed the document and exited QlikView after the previous lesson, you need to open it again.

- 1 Start QlikView by double-clicking the QlikView icon (for other ways of starting the program see page 19).
- 2 Choose **Open** from the **File** menu.
- 3 Select the file *MyApplication.qvw*, then click **Open**.



Automatic concatenation

If two tables that have exactly the same set of fields are entered, QlikView automatically treats the second table as a continuation of the first. This is called *concatenation* of tables.

Any number of tables can be concatenated into one table.

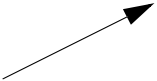
Your QlikView document retrieved data from a file with a limited number of countries. The *..Tutorial\Application\Data Sources* directory contains a second file listing countries, whose field names correspond exactly to those of the already loaded *Country1.csv*. When you load the second file, the two tables will be automatically concatenated.

- 1 Choose **Edit Script** from the **File** menu or from the toolbar.



- 2 Position the cursor after the **load** statement loading the file *Country1.csv* (all statements end with a semicolon) and press ENTER to get an empty row. The order of the **load** statements is arbitrary, but you get a better overview of your script by keeping the country files together.

```
Directory examples;
Load Country,
  Capital,
  [Area(km.sq)],
  [Population(mio)],
  [Pop. Growth],
  Currency,
  Inflation,
  [Official name of Country]
from country1.csv (ansi, txt, delimiter is ',', embedded labels);
Load [Customer ID],
  Customer,
  Address,
  City,
  Zip,
  Country
from customer.xls (ansi, biff, embedded labels, table is [CUSTOMER$]);
```



- 3 Click **Table Files**.
- 4 Select *Country2.csv*, then choose **Open**. This opens the **FileWizard** (see “Interpretation of the file Country1.csv in the file wizard” on page 135).
- 5 Make sure that **Delimited** is set as type, **Comma** as delimiter and that the check box **Embedded Labels** is selected.
- 6 You don’t need to rename any fields this time, so click **Finish**. You should now have a script similar to the following:

```
Directory;
Load Country,
  Capital,
  [Area(km.sq)],
  [Population(mio)],
  [Pop. Growth],
  Currency,
  Inflation,
  [Official name of Country]
FROM [Data Sources\Country1.csv] ((txt, codepage is 1252,
embedded labels, delimiter is ',', msq); );
```

```
Directory;
Load Country,
  Capital,
  [Area(km.sq)],
  [Population(mio)],
  [Pop. Growth],
  Currency,
  Inflation,
  [Official name of Country]
FROM [Data Sources\Country2.csv] ((txt, codepage is 1252,
embedded labels, delimiter is ',', msq); );
```

```
Directory;
Load [Customer ID],
```

```

Customer,
Address,
City,
Zip,
Country
FROM [Data Sources\CUSTOMER.xls] (biff, embedded labels,
table is [CUSTOMER$]);

Directory;
Load [Transaction ID],
Year,
Month,
Day,
[Salesman ID],
[Product ID],
[Serial No],
[ID Customer] as [Customer ID],
[List Price],
Sales,
[Gross Margin]
FROM [Data Sources\TRANSACTION.CSV] ((txt, codepage is 1252,
embedded labels, delimiter is ',', msq); );

```



Note that the sets of fields in *Country1.csv* and *Country2.csv* are exactly the same.

- 7 Choose **Reload**. The **Fields** page in the **Sheet Properties** dialog box (Figure 49 on page 138) is opened. The fields you selected last time are already in the column of displayed fields. No new fields have appeared in the list of available fields, since the field values of *Country2.csv* have been added to the corresponding fields of *Country1.csv*.
- 8 Choose **OK** to close the dialog.

At a first glance, your document will look very much like it did before; however, there are more entries in most list boxes. Some list boxes may have become wider or obtained scroll bars due to longer field contents.

- 9 Save your document.



Forced concatenation

Sometimes you want to concatenate tables also when they have different sets of fields. QlikView will then not automatically concatenate the two tables: you need to use the **concatenate** statement, which concatenates a table with the last created logical table.

In the previous section two tables with identical sets of fields, *Country1.csv* and *Country2.csv*, were concatenated. There is also a third file, *Country3.csv*, that contains only a subset of the fields. All three files are lists of countries. Furthermore, they contain different countries, so it is certainly relevant to concatenate the three files into one logical table.

The values of the missing fields in the concatenated table will be NULL, i.e. QlikView will treat these fields as having no value.

Do the following:

- 1 Choose **Edit Script** from the **File** menu or from the toolbar.
- 2 Position the cursor after the statement loading *Country2.csv*. This time the order of the statements is not arbitrary, since the **concatenate** statement forces concatenation with the last created logical table in the script.
- 3 Choose **Table Files**.
- 4 Select *country3.csv* and choose **Open**. This opens the **File Wizard** (see “Interpretation of the file Country1.csv in the file wizard” on page 135).



- 5 Make sure that the wizard has made a correct interpretation, then click **Finish**. This generates a script similar to the one below:

```
Load Country,
    Capital,
    [Area(km.sq)],
    [Population(mio)],
    [Pop. Growth],
    Currency,
    Inflation,
    [Official name of Country]
FROM [Data Sources\Country1.csv] ((txt, codepage is
1252, embedded labels, delimiter is ',', msq); );
```

```
Load Country,
    Capital,
    [Area(km.sq)],
    [Population(mio)],
    [Pop. Growth],
    Currency,
    Inflation,
    [Official name of Country]
FROM [Data Sources\Country2.csv] ((txt, codepage is
1252, embedded labels, delimiter is ',', msq); );
```

```
Load Country,
    [Official name of Country],
    [Area(km.sq)]
FROM [Data Sources\Country3.csv] ((txt, codepage is
1252, embedded labels, delimiter is ',', msq); );
```

```
Load [Customer ID],
    Customer,
    Address,
    City,
    Zip,
    Country
FROM [Data Sources\CUSTOMER.xls] (biff, embedded
labels, table is [CUSTOMER$]);
```

```
Load [Transaction ID],
    Year,
    Month,
    Day,
    [Salesman ID],
    [Product ID],
```

```

[Serial No],
[ID Customer] as [Customer ID],
[List Price],
Sales,
[Gross Margin]
FROM [Data Sources\TRANSACTION.CSV] ((txt, codepage is
1252, embedded labels, delimiter is ',', msq); );

```

Study the script. The three fields in the file *Country3.csv* are all found in *Country1.csv*, which constitutes the last created logical table. However, since the set of fields is not exactly the same, you need to add the word **concatenate** for the tables to be merged:

- 6 Position the cursor in front of the **load** statement that loads *Country3.csv* and type **Concatenate**. If the spelling is correct, the word **concatenate** will turn blue just like **load** and **from** etc., since it is also a keyword. Make sure there is a space between the two words:

```

...
Concatenate Load Country,
[Official name of Country],
[Area(km.sq)]
FROM [Data Sources\Country3.csv] (txt, codepage is
1252, embedded labels, delimiter is ',', msq); )
...

```

- 7 Choose **Reload**.

Your application should not have changed very much. There are, however, a few more countries.

- 8 Click the **OK** button.
- 9 Select the country *Seychelles*.

Seychelles is a country that is listed in the third file, and you can now see that only the list box *Area* contains optional data.

- 10 Clear your selections.
- 11 To get a clear picture of the contents of the concatenated table, create a table box containing the fields of the country files, i.e. *Country*, *Capital*, *Area (km.sq)*, *Population(mio)*, *Pop.Growth*, *Currency*, *Inflation*, *Official name of Country*.

12 Use the scroll bar to browse through the data of your table box. You'll note that some of the rows are not complete, but contain a '-' instead of a value. This is the case for all the countries from the third country file, containing only a subset of the fields: the values of the missing fields are treated as NULL.

Three logical tables have been loaded so far:

Country1 (concatenation of *Country1*, *Country2* and *Country3*) is a table listing countries. Each row contains information concerning a specific country.

Customer is a table listing customers. Each row contains information concerning a specific customer. This table is associated to the table above through the field *Country*, which is found in both tables.

Transact is a table listing transactions. Each row contains information concerning one sold unit. This table is associated to the table above through the field *Customer ID*, which is found in both tables.

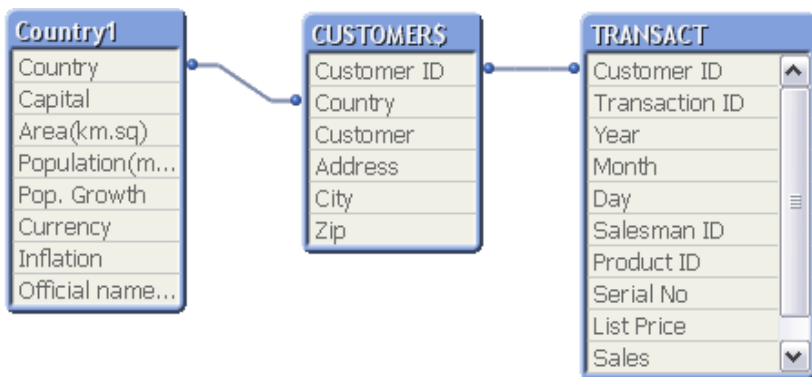


Figure 54. The associations made in the example that loads the tables *Country1*, *Customer* and *Transact*

When a selection is made in one of the tables, QlikView analyzes how the result of the selection affects the next logical table. When this table is analyzed, QlikView continues with the next logical table, etc. The result of the selection propagates through the chain of tables involved.

Note Structures with circular references, i.e. when the chain becomes a ring, should usually be avoided. These are sometimes a sign of an incorrect data model, in which two similar fields that have slightly different interpretations are treated as one and the same field. If QlikView discovers the circular

reference during the execution of the script, the tables will be set to loosely coupled. For further information, see the *Reference Manual*.

Using the Table Viewer

The tables and their associations can be shown graphically in the built-in **Table Viewer**.

- 1 Choose **Table Viewer** from the **File** menu.



The three tables loaded so far will appear. Each association is shown with a line connecting the associated fields in the respective tables.

- 2 Click on the header of the table *Country1*. All tables directly associated with this table (only one actually) will be highlighted.
- 3 Click on the field *Customer ID* in one of the tables where it appears. Notice that the field name will be highlighted in all tables where it appears.

As you get more complex table structures it may be useful to know that the tables can be moved over the background using the mouse. The same goes for the connector points on the lines connecting the tables.

The table view can be copied to the clipboard for inclusion in documentation or printed with the help of toolbar buttons available.

- 4 Close the **Table Viewer** by clicking **OK**.

The logical structure can also be studied by looking at the system fields. The part *Advanced Features* provides a lesson in which you can further analyze the structure of your application. See page 180.

Improving the layout

This part of the *Tutorial* being devoted to the creation of scripts, we have neglected the layout so far. However, creating a layout that is easy to work with and that provides a good overview of the information is extremely important in order to fully utilize the possibilities of QlikView.

Having data from three different domains at your disposal, you could create a layout with three different sheets, named *Geography*, *Customer* and *Sales* or something similar. Add list boxes and other sheet objects, move them and size them until you have an application that is easy to work with. If there are steps you don't remember, go back to the first part of the *Tutorial*, *Working with QlikView*, to get help.

If you like, you can compare the application that you created with the file *SampleApplication.qvw* that you find in the *Application* folder.

Saving, closing and exiting

If you don't want to turn to the next lesson right away, you can close the application. You should also save the application, since the following lessons are based on the work you've done so far.



LESSON 15 LINKING EXTERNAL INFORMATION TO A DOCUMENT

Besides associating and concatenating tables that contain data, it is also possible to link information to field values in the data. The links are defined in information tables which must be loaded in a special way. In this lesson you'll link flags to specific values in the *Country* list box.

Opening the document

If you closed the document and exited QlikView after the previous lesson, you need to open it again.

- 1 Start QlikView by double-clicking the QlikView icon (for other ways of starting the program see page 19).
- 2 Choose **Open** from the **File** menu.
- 3 Select the file *MyApplication.qvw*, then click **Open**.



Looking at an info file

Let's start by looking at the file containing the information to link.

- 1 Open a text editor, e.g. **Notepad**, and choose **Open** from the **File** menu.
- 2 In the box **Files of type**, select **All files**.

-
- Open the file *FLGSOECD.CSV* in the *..\Tutorial\Application\Data Sources* directory. It should look like Figure 55.

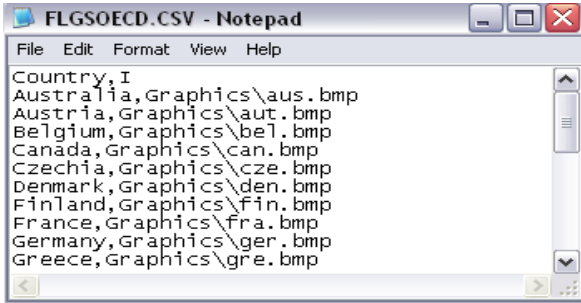


Figure 55. An information table defining that the specified bmp files should be linked to the listed country values.

It is a two-column table, in which different values of the field *Country* are associated with different files. Each value must be put on a separate row. The file associated with a field value will be shown, played, executed, etc. depending on the file type. Some file types, e.g. files of the bmp (images) or wav (sounds) type are handled internally in QlikView. For other file types, the associated program is used to open the document.

Note To associate a file type (with no association) with a program, open the Explorer (for Windows NT, Windows 2000 and Windows XP). Select a file of the concerned type in the structure and double-click it. This opens a list of available programs. Pick an appropriate program, preferably Notepad or Excel, then click **OK**. All files with this extension will from now on be opened with the program you selected. (Another possibility is to choose **View, Folder Options** from the Explorer menu and go to the **File Types** page.)

- Close the editor.

Loading the info file

The next step is to load the info file into QlikView.

- Choose **Edit Script**.
- Position the cursor at the end of the script and click **Table Files**.
- Select the file *FLGSOECD.CSV* and click **Open**. This opens the file wizard.

- 4 Like for the files already loaded, **Delimited** is set as type, **Comma** as delimiter. **Embedded Labels** is selected as label.
- 5 Click **Finish**.

The statement generated will load the file *FLGSOECD.CSV* as a regular data file. However, this is not what you want to do: you would like QlikView to use *FLG-SOECD.CSV* to link information to specific field values. This is done in the following way:

- 6 Change the script by manually adding the word **info** before the **load** statement. The word **info** being a keyword in the script, it will turn blue. The script should look similar to the following:

```

...
Directory;
Load [Transaction ID],
    Year,
    Month,
    Day,
    [Salesman ID],
    [Product ID],
    [Serial No],
    [ID Customer] as [Customer ID],
    [List Price],
    Sales,
    [Gross Margin]
FROM [Data Sources\TRANSACTION.CSV] (txt, codepage is
1252, embedded labels, delimiter is ',', msq); )

Directory;
Info Load Country,
    I
FROM [Data Sources\FLGSOECD.CSV] (txt, codepage is
1252, embedded labels, delimiter is ',', msq); )

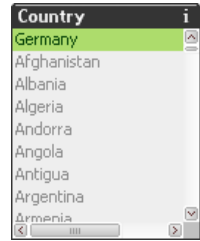
```

- 7 Choose **Reload**.
- 8 The **Fields** page is opened. No new fields have been added. Click **OK**.
- 9 Save your application.

Viewing the linked information

To view the information you've linked, do the following:

- 1 Select *Germany* from the list of countries.
- 2 A small info symbol appears in the upper right-hand corner of the list box. Click it. Note that the QlikView file and the images have to be placed in the same folder for this to work.



An independent window containing Germany's flag now appears in the application.

- 3 Close the window.
- 4 Select *France* from the list of countries.
- 5 Click the info symbol to make the specified picture appear (Figure 56).

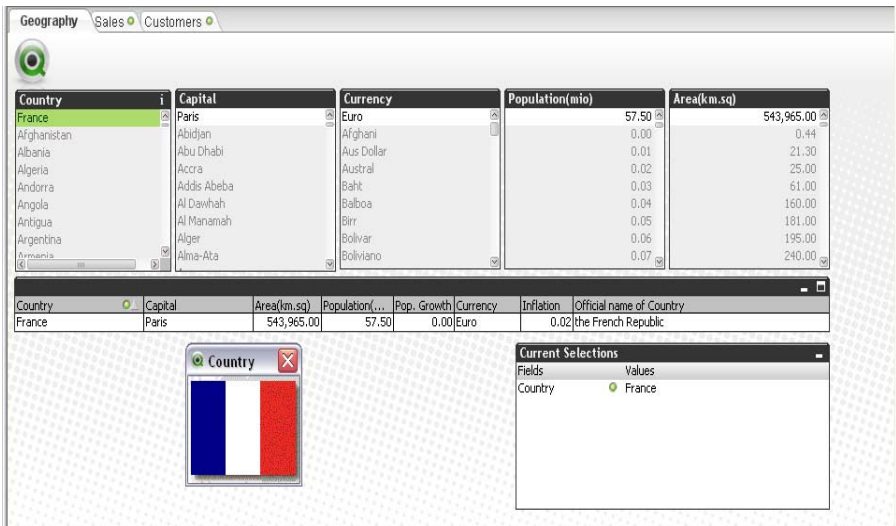


Figure 56. The French flag associated with the field value France

- 6 Close the flag and clear all selections.

This way, pictures and multimedia presentations can be shown in the right contexts, other applications can be started, and specific documents opened. You can link almost any type of file to field values. It is also possible to simply type words in the second field of the info table instead of specifying a path to a file. In that case, QlikView will show the text in an internal text viewer.

To learn more about creating and viewing info files, see the *Reference Manual*.

Embedding external info

In many cases it is good that pictures etc. do not have to be stored inside a QlikView document and take up space in memory and on disk. However, if you want to be able to send a QlikView document to other people without worrying about sending the picture files as well, there is an option to embed the info in the QlikView file.

- 1 Choose **Edit Script** again.
- 2 Find the statement which starts by `Info Load`.
- 3 Precede that statement with the word `Bundle`, so that it now starts `Bundle Info Load`.
- 4 Reload the script.

The flag pictures are now stored inside the QlikView document itself and do not need to be moved with the QlikView document.

Until now, you have only worked with comma separated text files and an Excel file, which you've been able to load directly into QlikView. In the next lesson, you'll get to know other types of files, and you'll also learn how to load files via ODBC.

Saving, closing and exiting

If you don't want to turn to the next lesson right away, you can close the application. You should also save the application, since the following lessons are based on the work you've done so far.



LESSON 16 LOADING ADDITIONAL FILES

All the files you've loaded so far have been text files or Excel files containing field names in the first row. In this lesson, you'll learn how to load a tab separated text file without field names. Moreover, you'll get an introduction to loading files via the ODBC interface.

Opening the document

If you closed the document and exited QlikView after the previous lesson, you need to open it again.

- 1 Start QlikView by double-clicking the QlikView icon (for other ways of starting the program see page 19).
- 2 Choose **Open** from the **File** menu.
- 3 Select the file *MyApplication.qvw*, then click **Open**.



Loading a tab separated file without labels

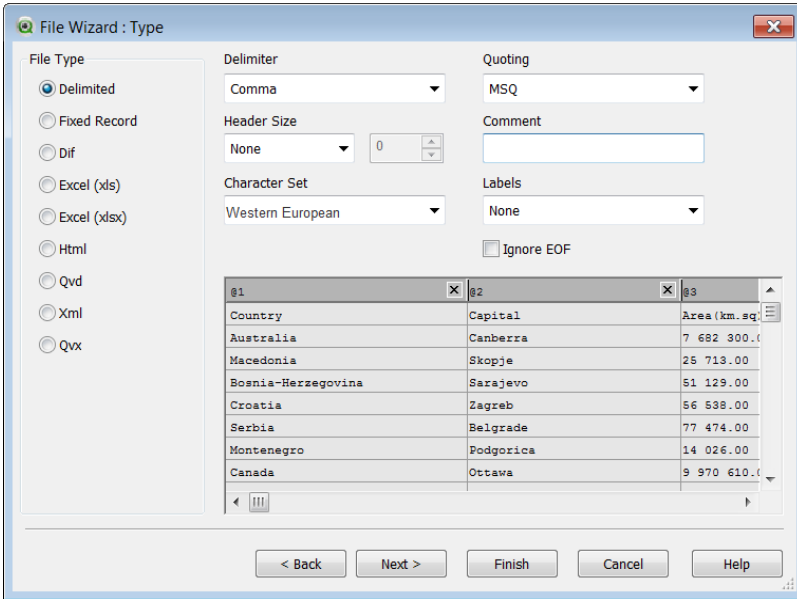


Figure 57. An example of interpretation of a file in the file wizard.

The `..\Tutorial\Application\Data Sources` directory contains a file with information on the markets to which the different countries belong. Just like the files you've loaded so far, `Markets.tab` is a text file; however, instead of being separated by commas, its field values are tab delimited. Furthermore, the file does not contain any labels (field names). The loading procedure is similar to the one you've encountered in the previous lessons:

- 1 Go to the *Sales* sheet.
- 2 Choose **Edit Script** from the **File** menu or from the toolbar.
- 3 Position the cursor at the end of the script.
- 4 Click **Table Files**.
- 5 Select `Markets.tab`, under `Tutorial/Application/Data Sources`, then choose **Open**. This opens the **File Wizard**.



Delimited is still set as type, but this time **Tab** is selected as the delimiter.

For QlikView to find relations between the new file and those that have already been loaded, you need to give the fields appropriate names. Naming the first field *Market* seems like a good choice; the second one should be named *Country* to be associated with the *Country* fields of the files *Country1.csv* and *Customer.xls*. This is done in the following way:

- 6 Click in the header of the first column where it says @1. Type *Market* and press ENTER. Click in the header of the second column where it says @2. Type *Country* and press ENTER
- 7 Click **Finish**. Your script now looks similar to the one below:

```

...
Bundle Info Load Country,
      I
from infofile.csv (txt, codepage is 1252, embedded
labels, delimiter is ',', msq); )
Load      @1 as Market,
          @2 as Country
from [Data Sources\markets.tab] (txt, codepage is 1252,
no labels, delimiter is '\t', msq); )

```

Study the script. Note the contents of the final parenthesis: the delimiter is not comma (','), but tab ('\t'), and the text **no labels** appears instead of the usual **embedded labels**.

- 8 Click **Reload** to execute the script.
- 9 Move the new field *Market* to the column of displayed fields, then click **OK**.

If you have followed all the steps correctly, you can now study the sales development for different markets during different years.

Loading a file via OLE DB

Until now you have always loaded files directly into QlikView. However, if you want to access general databases or files that are not stored in a format that QlikView can read, you need to use OLE DB or ODBC (Open DataBase Connectivity).

In this example we will only create an OLE DB connection. For information on ODBC, please refer to the *Reference Manual*. Please note that QlikView works with both 32-bit and 64-bit ODBC drivers. It is however very important to use the corresponding versions of the ODBC drivers and the program version, i.e. the 32-bit version of QlikView will only work with the 32-bit ODBC drivers and 64-bit QlikView will only work with the 64-bit ODBC drivers..

In the *..Tutorial\Application\Data Sources* directory you'll find an Access file named *Salesman.mdb*, which contains the names of the salesmen who performed the sales described in the file *Transact.csv*. The names of the salesmen are of great importance to you, so you would like to associate *Salesman.mdb* to the existing data of your application.

One possible way of doing this is to simply save the file as a character separated text file, i.e. a file that QlikView can read.

However, it is also possible to load the file via OLE DB, which is what you'll do in this example.

- 1 Open the **Edit Script** dialog.
- 2 Select **OLE DB** and click the **Connect** button to establish a connection with the data source.
- 3 The **Data Link Properties** dialog opens. Make sure that the *OLE DB Provider for ODBC Drivers* is selected, then click **Next >>** to get to the **Connection** page.
- 4 Since you are working with a generic data source not yet defined, select the option **Use connection string**, then click the **Build** button. The **Select Data Source** dialog opens.
- 5 Go to the tab **Machine Data Source**.
- 6 Select *MS Access Database*, then click **OK**.
- 7 From the **Login** dialog that opens, click the **Database...** button. The **Select Database** dialog opens.
- 8 Browse for the file in the *Tutorial\Application\Data Sources* directory. Once you find the correct location, the salesman file should be the only one available in the left list. Select it, then click **OK** to close the dialog.
- 9 Click **OK** to close the remaining dialogs.

Your script now contains a **connect** statement, connecting you to the selected data source. The statement should now look similar to this:

```
CONNECT TO [Provider=MSDASQL.1;Persist Security
Info=False;Extended Properties="DSN=MS Access Database;DBQ=
C:\Program
Files\QlikView\Tutorial\Application\DataSources\Salesman.mdb
;DefaultDir=U:\jhs\Tutorial_Files_QV_8\English
features\Tutorial\Application\Data
Sources;DriverId=281;FIL=MS
Access;MaxBufferSize=2048;PageTimeout=5;UID=admin;"];
```

The next step is to select the tables (in this case there is only one, but if you access a database you usually have a great number of tables to choose from) and fields to load:

- 10 In the **Edit Script** dialog, mark the **OLE DB** checkbox, then click the **Select...** button.

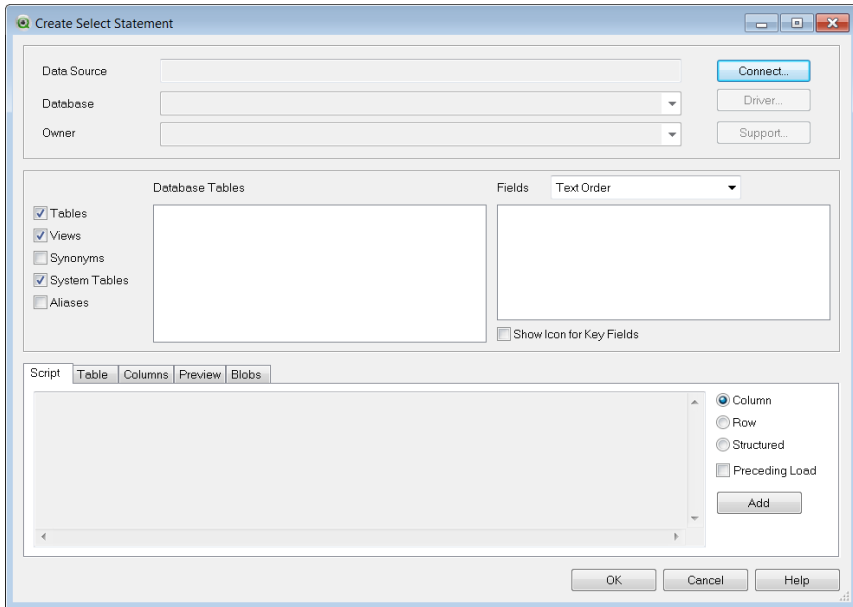


Figure 58. The Create Select Statement dialog.

The **Create Select Statement** dialog is now opened. The **Fields** box lists the available fields, whereas the **Database Tables** box contains the available tables. At the bottom of the dialog, you get a preview of the statement (a standard SQL **select** statement, which will appear in your script as soon as you click **OK**).

By default, a star is selected in the **SELECT** group. The star is equivalent to all fields. You want to load all fields, but for consistency reasons you'll select them to make their names appear in the script:

- 11 Select *Salesman* in the *Database Tables* list to the left.
- 12 Click on the field *Salesman ID*, then press the SHIFT key and hold it down while clicking *Salesman* and *Distributor ID*. See the picture on page 173.
- 13 Click **OK**. Your script should now look similar to the following:

```
SQL SELECT `Distributor ID`,
Salesman,
`Salesman ID`
FROM `C:\Program Files\QlikView\Tutorial\Application\Data
Sources\Salesman`.SALESMAN;
```

The salesman table is associated with the existing data via the field *Salesman ID*, which it has in common with *Transact.csv*.

14 Click **Reload**.

15 Add the new field *Salesman* to the *Sales* sheet and study the relations by making a few selections.

16 Clear your selections.

You have now finished the second part of the *Tutorial*. In addition to the basic knowledge about selections, sheets and sheet objects acquired in the first part (*Working with QlikView*), you have learned how different kinds of files are loaded into the associative QlikView database and how the logical structure is created.

The final part of the *Tutorial, Advanced Features*, lets you further explore the possibilities of QlikView. It differs from the first two parts in that it contains independent lessons (i.e. the procedures performed are not based on the work done in previous lessons), thereby allowing you to immediately go to the lesson that interests you the most.

Saving, closing and exiting

You can now close the application that you created. If you like, you can compare it with the file *SampleApplication.qvw* that you find in the *Application* folder.

ADVANCED FEATURES

- **More about associations**
- **Load inline**
- **Field groups and cyclic display in charts**
- **Cross tables**
- **And-mode**
- **Number formats**
- **Security**



Introduction

This final part of the *Tutorial* deepens the knowledge you've already acquired and lets you further explore the possibilities of QlikView. Among other things, you'll learn how to modify the script to load different types of table formats in an optimal way and how to use access restriction. Moreover, *Advanced Features* provides a chapter on the interpretation and formatting of numbers. Although most of the functions presented are related to the script, we have also devoted a chapter to advanced layout features: you'll learn to create hierarchic and cyclic field groups and to use cyclic expressions in charts.

The lessons in this third part of the Tutorial, *Advanced Features*, are independent (i.e. the procedures performed are not based on the work done in previous lessons), which allows you to immediately go to the lesson that interests you the most.

The files used in this part are found in the `..\Tutorial\Advanced` directory.



LESSON 17 MORE ABOUT ASSOCIATIONS

The **Fields** page appearing after every script execution contains a check box named **Show System Fields**. If this check box is selected, the column listing available fields includes six fields preceded by a dollar sign (\$). These fields, called *system fields*, are very useful for obtaining an overview of the logical structure of a QlikView document.

The first section of this lesson describes the system fields and shows how they can be displayed on a system sheet. The second part shows an example of how you can solve a common problem using the system fields: display of frequency information in associating fields.

Creating a system sheet

- 1 Start QlikView.
- 2 Choose **Open** from the **File** menu.
- 3 Select the file *Advanced.qvw* found in the *Advanced* folder, then click **Open**.
- 4 Choose **Add Sheet...** from the **Layout** menu.
- 5 Go to the **Sheet Properties** dialog. Name the sheet *System*.
- 6 Go to the **Fields** page.
- 7 Move the system fields (the ones preceded by a dollar sign, \$) to the column **Fields Displayed in Listboxes**. If the system fields are not visible, mark the check box **Show System Fields**.



The system fields show

- the names of the fields retrieved (*\$Field*),
 - the names of the tables loaded (*\$Table*),
 - the number of rows and columns in a table (*\$Rows* and *\$Fields*),
 - the column number for a specific field (*\$FieldNo*), and
 - the names of the info tables loaded (*\$Info*).
- 8 Click **OK**.
 - 9 Size the list boxes until you see all the field names and all the field values, then rearrange the boxes.

Using the system sheet

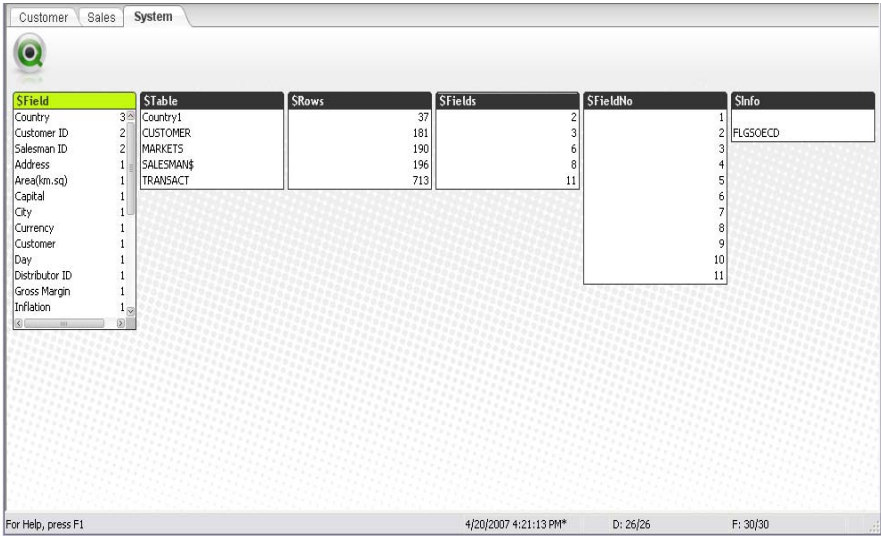


Figure 59. The System sheet

Your system sheet is now ready, but to further improve it, choose frequency display for the list box *\$Field*:

- 1 Open the **Properties** dialog for the list box *\$Field* and go to the **General** page.
- 2 Select the check box **Show Frequency**, then go to the **Sort** page.
- 3 Select **Frequency, Descending**, then click **OK**.

The values in the field *\$Field* are now followed by numbers indicating their number of occurrences in the tables. The list box being sorted by frequency, the field with the greatest number of occurrences is placed at the top.

You see that the field *Country* occurs in three tables, *Customer ID* and *Salesman ID* in two tables, and all the other fields in only one table. Now click the Table Viewer icon to have a closer look at the structure.



The three fields appearing more than once are the fields used to associate the tables of the document. The relations are illustrated in the figure below:

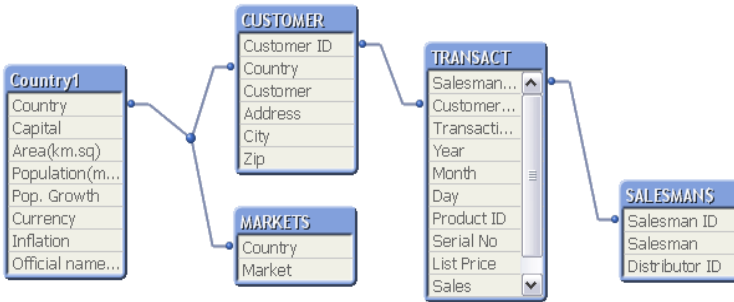



Figure 60. The logical structure seen in the Table Viewer

- 4 Click **OK** to go back to your document.
- 5 Click *Country* in the *\$Field* box.

The program now shows that the field *Country* occurs in the tables *Country1* (a logical table consisting of three concatenated country tables), *Customer* and *Markets*. The other list boxes provide additional information on the number of rows and fields of the concerned tables, and on the column numbers of the field in the respective tables.

Moreover, the list box *\$Info* on the system sheet shows the info table associated with the field *Country*.

As soon as only one table or info table is possible (selected or optional) in a list box, a small info symbol  is displayed in the top right-hand corner of the list box. Clicking this will allow you to edit the table directly:

- 6 Click one of the optional tables in the list box *\$Table*.
- 7 The info symbol appears in the top right-hand corner. Click it. Note that the files have to be placed in the same folder in order for this to work.
- 8 The original table is now opened by the associated program. Study it, then close the program to get back to QlikView.
- 9 Clear your selections.

Note If the file type of the table (usually the extension csv) is not associated with an appropriate text editor, the table will not be opened. To associate a file type with a program, open the Windows Explorer. Select a file of the concerned type in the structure and double-click it. This opens a list of available programs. Pick an appropriate program, preferably Notepad or

Excel, then click **OK**. (Another possibility is to choose **View, Folder Options** from the Explorer menu and go to the **File Types** page.)

When working with large sets of data with complicated structures, it is impossible to keep the entire data structure in mind. The system sheet is then of crucial importance.

Creating a system table

Besides displaying the system fields in list boxes, you can also illustrate the relations by creating a system table:

- 1 Right-click on the sheet to open the **New Sheet Object** menu where you select **System Table**.

The system table now appears on your system sheet. Size it. Study it. You'll find that the first column, listing all the fields found in the document, is followed by one column for each loaded table. If a table contains the field listed in the leftmost column, the field also occurs in the table column; if not, a '-' (indicating a NULL value) is displayed. You easily see which of the fields are keys, i.e. common to more than one table. The system table thus clearly shows how the tables of the document are associated. It can be a useful complement to the **Table Viewer** described in Lesson 13 on page 160.



\$Field	\$Table	Country1	CUSTOMER	TRANSACTION	MARKETS	SALESMAN\$
Country	Country	Country	-	-	Country	-
Customer ID	-	Customer ID	Customer ID	-	-	-
Salesman ID	-	-	Salesman ID	-	-	Salesman ID
Capital	Capital	-	-	-	-	-
Area(km.sq)	Area(km.sq)	-	-	-	-	-
Population(mio)	Population(mio)	-	-	-	-	-
Pop. Growth	Pop. Growth	-	-	-	-	-
Currency	Currency	-	-	-	-	-
Inflation	Inflation	-	-	-	-	-
Official name of ...	Official name of...	-	-	-	-	-
Customer	-	Customer	-	-	-	-
Address	-	Address	-	-	-	-
City	-	City	-	-	-	-
Zip	-	Zip	-	-	-	-
Transaction ID	-	-	Transaction ID	-	-	-
Year	-	-	Year	-	-	-
Month	-	-	Month	-	-	-

Figure 61. The system table

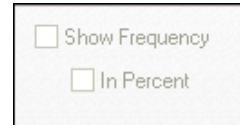
One of many examples of situations where the use of system variables is indispensable is the one below.

Showing frequency in associating fields

Suppose you work with the *Customers* sheet and want to see how many customers you have in different countries, i.e. how many times the countries occur in the data.

- 1 Go to the *Customers* sheet of your document.
- 2 Click on the list box *Country* with the right mouse button, then click **Properties**.
- 3 Go to the **General** page.

The check box **Show Frequency** is disabled, i.e. it is not possible to show frequency for this field. Why?



By studying the *System* sheet, you clearly see that the field *Country* occurs in more than one table. As a matter of fact, three of the loaded tables contain a field named *Country*. *Country1* and *Market*, containing geographical information and a list of the markets to which different countries belong, respectively, list each country only once. The *Customer* table, however, contains more than one occurrence of countries in which several customers reside. The three *Country* fields being treated as one due to the associations, it is impossible for the program to know which of the tables it should use for calculating data frequencies.

Since making guesses could lead to erroneous results, QlikView has been designed not to allow certain operations when the data interpretation is ambiguous for associating fields.

What you are actually interested in is the frequency of the countries in the customer table. To obtain the information you need, load the field *Country* a second time under a new name from the table *Customer.csv*:

- 4 Close the **List Box Properties** dialog.
- 5 Open the **Edit Script** dialog.
- 6 Find the statement loading *Customer.csv* and position the cursor after the last field (*Country*), then type ", **Country as CustomerCountry**". The **load** statement now looks similar to the following:

```
Load      [Customer ID],
          Customer,
          Address,
          City,
          Zip,
          Country, Country as CustomerCountry
from [Data Sources\Customer.csv]
(txt, codepage is 1252, embedded labels, delimiter is
',', msq); );
```

You need to keep the field *Country*, otherwise there will be no key field and thus no association with previously loaded tables.

7 Click **Reload**.

8 Move the new field *CustomerCountry* to the list of displayed fields, then click **OK**.

Your *Customers* sheet now contains a second country list box, listing only the countries in which there are customers. Having a name that is not common to any other field name in the document, this second field is not an associating field. It is thus possible to show frequency information.

9 Click on the *CustomerCountry* list box with the right mouse button, then choose **Properties**.

10 On the **General** page, select the check box **Show Frequency**, then go to the **Sort** page.

11 Select **Frequency**, then click **OK**.

The countries are now displayed in frequency order. You may have to size the list box to see the numbers.

Since it actually makes more sense to have the field *CustomerCountry* on this sheet than the *Country* field (you aren't interested in the countries in which you have no customers), do the following:

12 Remove the list box *Country*.

When selecting countries on the *Customers* sheet, there will now always be at least one customer optional.

13 Adjust the layout.

14 Save the file.

Associating fields have yet two limitations besides the inability to show frequency:

- Statistics boxes based on an associating field show n/a for most statistical entities.

- In charts using an associating field, it is not possible to create expressions containing functions that depend on frequency information (e.g. sum, count functions, average) unless the distinct modifier is turned on.
- 15 Close the file. If you wish, compare it with the file *SystemFinal.qvw* found in the *Advanced* folder.
- 16 If you won't be working with QlikView for a while, you can now exit the program.

For more information, see the *Reference Manual*.



LESSON 18 LOAD INLINE

In some cases, you may want to add data by typing it directly in the script rather than loading it from a file or a database. In this lesson you'll learn how to do this with **load inline**.

Load inline can also be used for mapping (associating new information with already existing information via a field name), which constitutes the second section of this lesson.

Adding a record with load inline

- 1 Start QlikView and open the file *Inline.qvw* found in the *..\Tutorial\Advanced* directory.

The document has been created from two tables, *Customer.csv* and *Transact.csv*. Suppose you want to add a customer to the document, but without changing the original files. Do the following:

- 2 Open the **Edit Script** dialog.
- 3 Position the cursor at the end of the script, then type the following lines:

```
Load * Inline [
  Customer ID, Customer, Address, City, Zip, Country
  1181, Alexander's Catering Service, Fisherman's Drive
  4, Portsmouth, BH 354 RW, Great Britain];
```

The first line (**Customer ID, Customer, Address, City, Zip, Country**) lists the field names of *Customer.csv* (the table to which you want to add the record).

The second line (**1181, Alexander's Catering Service, Fisherman's Drive 4, Portsmouth, BH 354 RW, Great Britain**) contains the record that is to be added.

The star symbol ***** is equivalent to "all fields".

Note Due to limited space, the record in the above example does not fit in one line. When reproducing this **inline** clause in the script, however, it is important that you put the entire record in one single line: *Portsmouth etc.* should thus follow directly after *Fisherman's Drive 4*. See the file *InlineFinal.qvw* in the *Advanced* folder.

- 4 Choose **Reload**.
- 5 Choose **OK** to close the dialog.

-
- 6 No new field has been added, but there are new field values in some of the list boxes. Click *Alexander's Catering Service* in the customer list and study the result.

The data enclosed by the parenthesis after **inline** is treated like an ordinary table. Having the same set of fields as the customer table, the inline table has been concatenated with the customer table. You can easily check this by studying the *System* sheet: only two tables are displayed in the *\$Table* list box (the concatenated table is always given the name of the first input table, which, in this case, is *Customer*).

Save the document as *MyInline.qvw* or something similar.

Naturally, inline tables can be used for other purposes than for adding records to existing tables. If, for instance, you wish to load very small tables, it may be easier to create these directly in the script than to create and load an external file.

Mapping data with load inline

The document *Inline.qvw* contains a field with the months of the year written as numbers. Suppose you want to create a chart with the names of the months spelled out, and another chart showing sales per quarter. This is easily solved with data mapping.

Data mapping means associating new information to already existing information via a field name. Typical examples of data mapping could be connecting an account number to an account name or splitting a date into three fields for year, month and day, respectively. The data mapping can be done using an external file or straight in the script using **load inline**.

In this example, you'll use **load inline** to map month numbers against month names and quarters.

This time we will use the built-in inline wizard to create the load inline statement, usually a much more convenient method than typing directly in the script.

- 1 Open the **Edit Script** dialog.
- 2 Position the cursor at the end of the script.
- 3 Open the **Inline Data Wizard** from the **Insert** menu, **Load Statement**, **Load Inline**.
- 4 The dialog that opens looks like a small spreadsheet and in fact works much like one. However there is no support for formulas in the data cells.
- 5 The cursor will be positioned in the top left data cell. Enter the *l* as shown in the picture below. Use ENTER or the arrow keys to move between cells and fill in the table as shown below.

- 6 Finally double-click in the header row over *1* and enter the field name *Month*. Repeat for the remaining columns as shown below.

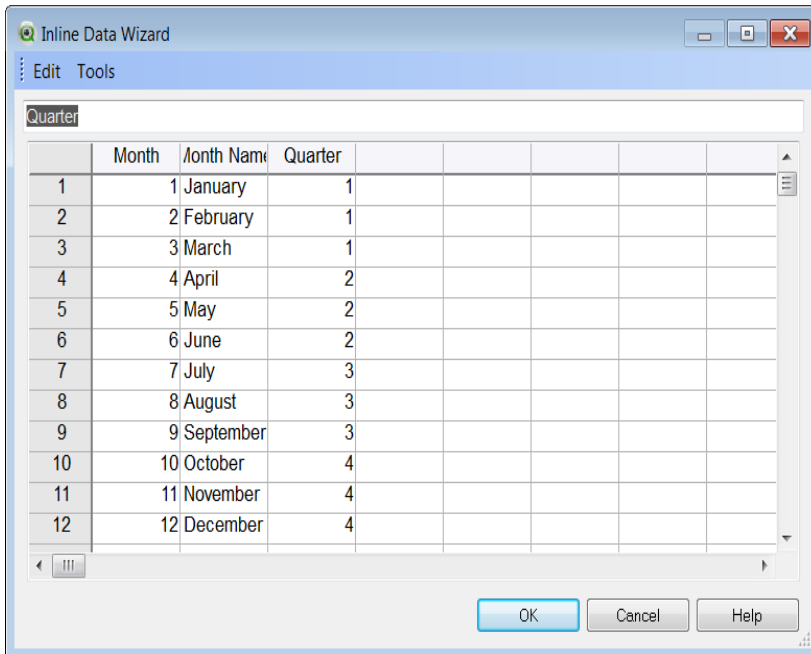


Figure 62. The Inline Data Wizard

Tip! If you need a table in e.g. Excel it can of course be pasted into the QlikView in-line wizard.

- 7 Click **OK** and you should have a piece of script looking like this:

```
LOAD * INLINE [
Month, Month Name, Quarter
1, January, 1
2, February, 1
3, March, 1
4, April, 2
5, May, 2
6, June, 2
7, July, 3
8, August, 3
9, September, 3
10, October, 4
11, November, 4
12, December, 4];
```

8 Choose **Reload**.

Two new fields have been added to the list of available fields, *Month Name* and *Quarter*. The inline table has been associated with the transact table via the field *Month*.

9 Click **OK**.

10 Create a bar chart showing sales per quarter (choose *Quarter* as variable and add the expression *Sum of Sales*). In case you need help, see *Working with QlikView* on page 63.

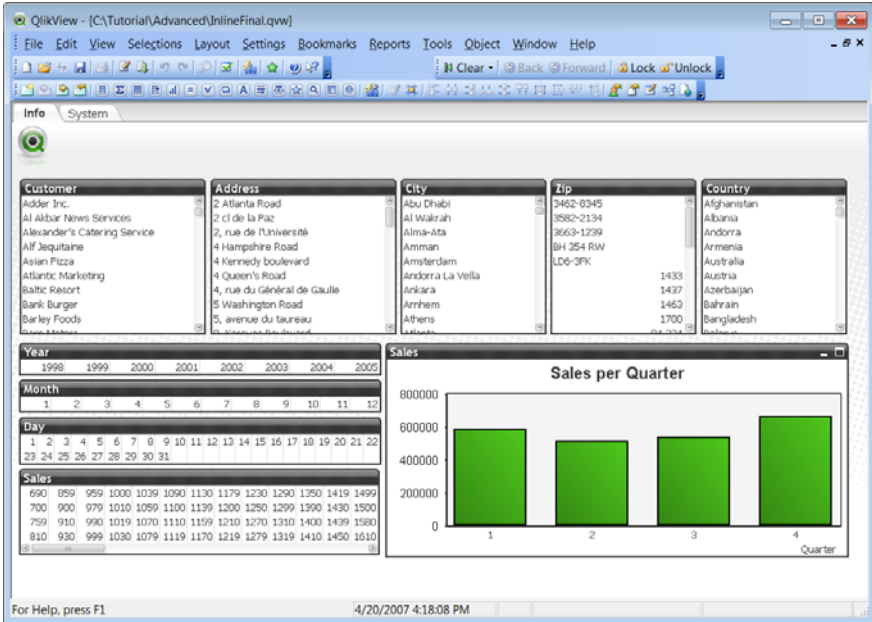


Figure 63. The potential appearance of your inline document.

11 Save the document under a name of your choice and close the file. If you wish, compare your file with the file *InlineFinal.qvw*.

12 If you won't be working with QlikView for a while, you can also exit the program.

LESSON 19 FIELD GROUPS AND CYCLIC DISPLAY

Instead of displaying single fields as dimensions in charts, it is possible to define groups of fields to be used for this purpose. Working with field groups allows you to display data in a very efficient way, since the resulting charts will show the selected fields in a hierarchical (drill-down) or cyclic sequence. In this lesson, these important features will be explained: you'll define both hierarchic and cyclic field groups and create corresponding charts.

The use of field groups should not be confused with cyclic display in charts. Cyclic display, constituting the last part of this lesson, can be applied to any chart having more than one expression, and results in the *expressions* being displayed sequentially. Just like the use of field groups, however, it saves space and allows you to make quick changes in the data displayed in the chart.

Field groups

One main difference between QlikView and many other database viewers, OLAP tools etc. is that in QlikView there is no need to predefine any hierarchies in the input data. The unique associative logic of QlikView gives you the complete freedom to access any field as a full dimension in any order you like. For most purposes this freedom is extremely powerful.

However, there are occasions when a predefined hierarchy could actually help you to display data more efficiently. QlikView therefore offers the possibility to define groups of fields. The groups can be hierarchic (drill-down) or non-hierarchic (cyclic).

Creating a drill-down group

When several fields form a natural hierarchy, it makes sense to create a drill-down group.


- 1 Start QlikView, then open the file *Groups.qvw* found in the *..\Tutorial\Advanced* directory.
- 2 Choose **Document Properties** from the **Settings** menu and go to the **Groups** page.
- 3 Click the **New...** button. The **Group Settings** dialog opens. Change the default name to *Time* in the **Group Name** box.
- 4 Select *Year*, *Quarter* and *Month* in the list of available fields by CTRL-clicking them, then click **Add** to move them to the column of used fields. You can also double-click them to move them.


-
- 5 Use the **Promote** and **Demote** buttons to get the correct hierarchy: *Year, Quarter, Month*. This is of great importance, since the order of the fields in the group corresponds to the display order in charts.
 - 6 Click **OK** twice.

You have now created a drill-down group, which you can use as a dimension variable in a chart.

Creating and using a chart with drill-down functionality

To create a drill-down bar chart, do the following:

- 1 Go to the *Sales* sheet, then click the **Create chart** button in the toolbar (if the design toolbar is not displayed, choose **Toolbars - Design** from the **View** menu). 
- 2 Choose *Drill-down* as window title, then click **Next >** to go to the **Dimensions** page.

The *Time* group that you created previously is listed among the ordinary field names. However, it can easily be distinguished from them: field groups are always preceded by specific symbols. For drill-down groups, this symbol is a straight arrow. 

- 3 Choose *Time* as variable by moving it to **Used Dimensions**.
- 4 Click **Next >**.
- 5 The **Edit Expression** dialog automatically opens. Compose the expression *Sum (Sales)*, then click **Paste**, then **OK**.
- 6 Type *Sales* in the **Label** box and click **Next >**.
- 7 Click **Next >** until you get to the **Colors** page. Select the check box **Multicolored**.
- 8 Click **Next >** to get to the **Number** page.

- 9 On the **Number** page, select **Integer**. Type *1000\$* in the **Thousand Symbol** box, then click **Finish**.

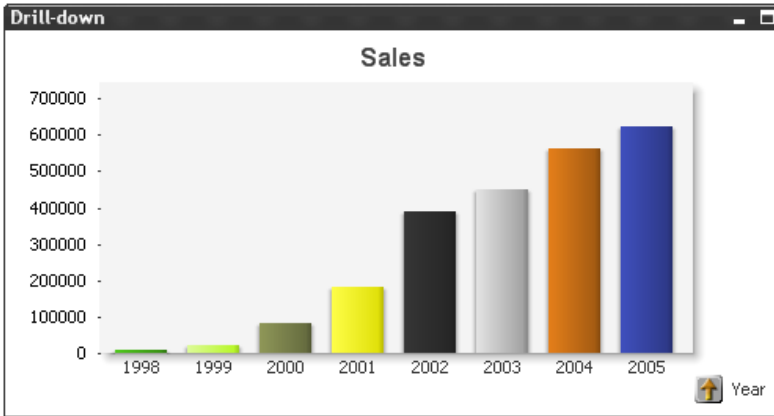


Figure 64. The drill-down chart

The chart, showing the sum of sales per year, looks like any other bar chart. However, as soon as you make a selection causing the field *Year* to have only one possible value, you discover its drill-down character:

- 10 Select the bar *2002* in the chart.

An ordinary chart would now display one bar, representing the sum of sales for 2002. This chart, however, shows the sum of sales for each *quarter* of the year 2002 (the second field in the field list defined being *Quarter*).

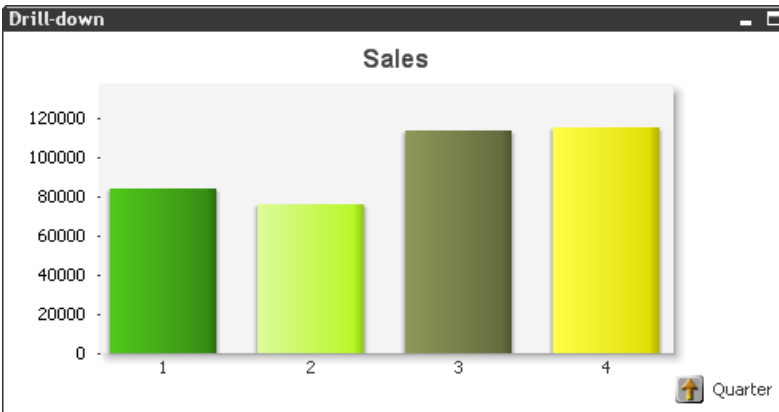


Figure 65. The drill-down chart showing the second field in the hierarchy.

11 Select the bar representing the fourth quarter.

The chart turns to showing the sales for each month of the selected quarter. *Month* is the third, and last, field in the field group.

As soon as more than one value becomes possible in the fields further up in the hierarchy, the chart is automatically drilled back up.

To go back in the hierarchy, click on the drill-up icon next to the field name.



12 Minimize the chart.

Creating a cyclic group

Sometimes it may be useful to group fields which do not form a natural hierarchy or do not have anything in common at all. The reason would be to make quick changes of the data displayed in a chart and to save space.

Any fields can be grouped together in a cyclic group.

- 1 Choose **Document Properties** from the **Settings** menu and go to the **Groups** page.
- 2 Click the **New** button. The **Group Settings** dialog opens. Change the default name to *Cyclic* in the name box.
- 3 Double-click *Country*, *Salesman* and *Year* in the list of available fields to move them to the column of used fields. The order of the fields in the list is of no importance when defining cyclic groups.
- 4 Select the **Cyclic Group** option.
- 5 Click **OK** twice.



You have now created a cyclic group. When used as a dimension in a chart, it will allow you to switch between the fields of the group (x-axis) while keeping the same expression (y-axis).

Creating and using a cyclic bar chart

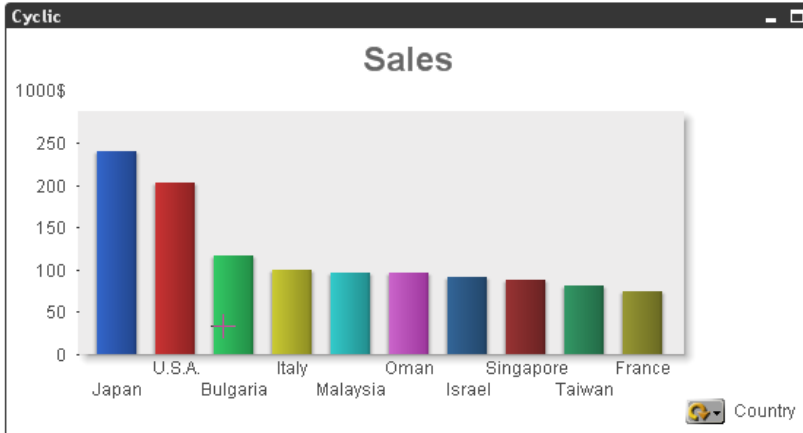


Figure 66. The cyclic chart

To create a cyclic chart, do the following:

- 1 Click the **Create chart** button in the toolbar (if the design toolbar is not displayed, choose **View - Toolbars - Design**).
- 2 Choose *Cyclic* as window title, then click **Next >** to go to the **Dimensions** page.

The *Cyclic* group is listed among the ordinary field names. Just like the drill-down group, it is preceded by a symbol. For cyclic groups, this symbol is a circular arrow.



- 3 Double-click the *Cyclic* group to move it to the column of displayed fields/groups.
- 4 Click **Next >**.
- 5 The **Edit Expression** dialog automatically opens. Compose the expression *Sum of Sales*, then click **OK** to close the dialog.
- 6 Type *Sales* in the **Label** box.
- 7 Click **Next >**. On the **Sort** page, sort the values by *y-value*, *Descending*. Click **Next >** until you get to the **Presentation** page.
- 8 On the **Presentation** page, set **Max Visible Number** to 10.
- 9 Click **Next >** until you get to the **Colors** page. Mark the check box **Multicolored**. Click **Next >** to reach the **Number** page.

- 10 On the **Number** page, select **Integer** and type *1000\$* in the **Thousand Symbol** box, then click **Finish**.

Initially, your chart shows the sum of sales per *Country*, which is the first field in the field list.

- 11 Switch to the next field by clicking the cycle icon in the bottom right-hand corner of the chart. Now *Salesman*, the second field, is displayed.

- 12 If you click the icon a second time, the sum of sales per year will be shown. *Year* is the third and last field of the field group.

When the last field in the list has been used, the turn goes back to the first field. The chart can be cycled indefinitely.

It is also possible to right-click on the cycle icon, in which case a list of the fields in the cyclic group is displayed for direct selection (see the picture).

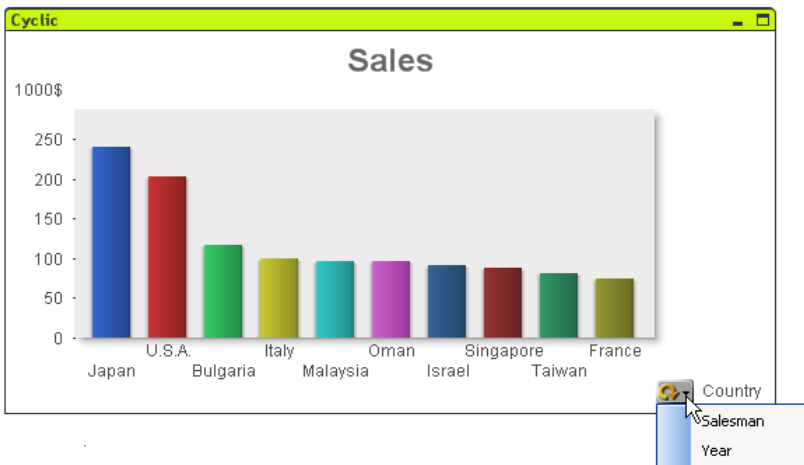


Figure 67. Direct selection in the cyclic icon when right-clicking it

- 13 Minimize the chart.

Showing three charts in one frame in this way is a very efficient way of displaying data. It also allows you to make quick changes of graphically displayed data.

Cyclic display of expressions

The **Expressions** page in the **Chart Properties** dialog provides a button named **Group**. If you have a chart with two expressions, you can choose to display them sequentially instead of simultaneously. The switching between expressions is done via a button similar to the one used in cyclic charts.

To create a bar chart with cyclic display of expressions, do the following:

- 1 Click the **Create chart** button in the toolbar (if the design toolbar is not displayed, choose **View - Toolbars - Design**).
- 2 Choose *Cyclic Display* as window title, then click **Next >** to go to the **Dimensions** page.
- 3 Move the field *Year* to the column of displayed fields, then click **Next >**.
- 4 The **Edit Expression** dialog automatically opens. Compose the expression *Sum of Sales*, then click **Paste**.
- 5 Click **OK**. The expression is now shown on the **Expressions** page. Note that the **Group** button is disabled: you need two expressions in the chart in order to be able to use it.
- 6 Click **Add** to add a second expression.
- 7 This time, create the expression *Count (Sales)*.
- 8 Click **Paste**, then **OK**. The **Group** button is now enabled: click it.
- 9 Click **Next >** until you reach the **Colors** page. Mark the check box **Multicolored**. Click **Next >**.
- 10 On the **Number** page, select **Integer** and set *1000\$* as **Thousand Symbol** (for the first expression), then click **Finish**.

The chart looks like an ordinary bar chart showing the sum of sales per year.

However, the cycle icon in the bottom left-hand corner indicates that the chart has further potential.

- 11 Click the cycle icon.

The chart now turns to showing the number (total count) of sales performed during different years:

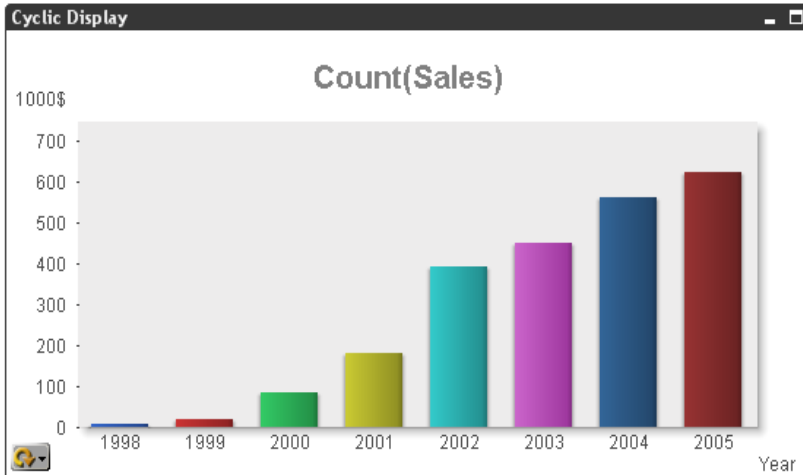


Figure 68. The chart using the second expression

Naturally, you can choose to display more than two expressions this way. It is also possible to combine groups and cyclic display into powerful multi-dimensional charts. Only your imagination will set the limits.

- 12 Save the document using a name of your choice. If you wish, compare it with the file *GroupsFinal.qvw*.
- 13 Close the file. If you won't be working with QlikView for a while, you can also exit the program.

LESSON 20 LOADING CROSS TABLES

A cross table is a common type of table featuring a matrix of values between two orthogonal lists of header data. By using the QlikView **crosstable** statement, you can load this type of table in a very elegant way. The procedure is described in this chapter.

Loading a cross table

You'll start by looking at a crosstable in Excel (or a similar program):

Open the Explorer, then find the file *Crosstable1.csv* in the `..\Tutorial\Advanced\Data Sources` directory and double-click it.

Microsoft Excel opens the file. It looks like below:

Year	Jan	Feb	Mar	Apr	May	Jun
2001	45	65	78	12	78	22
2002	11	23	22	22	45	85
2003	65	56	22	79	12	56
2004	45	24	32	78	55	15
2005	45	56	35	78	68	82

Figure 69. The *Crosstable1.csv* file

If this table is loaded into QlikView the usual way, the result will be one field for *Year* and one field for each of the months. This is generally not what you want: you would probably prefer to have three fields generated, one for each header category (*Year* and *Month*) and one for the data values inside the matrix.

You'll start by loading the table into QlikView the usual way:

- 1 Close the file.
- 2 Start QlikView and choose **New** from the **File** menu. Name the document-*Crosstable.qvw* and save it in the *Advanced* folder.
- 3 Open the **Edit Script** dialog.
- 4 Click **Table Files** and browse for the file *Crosstable1.csv* (in the *Advanced* Folder under *Data Sources*). Click **Open**.
- 5 If the file wizard has made a correct interpretation, click **Finish**.

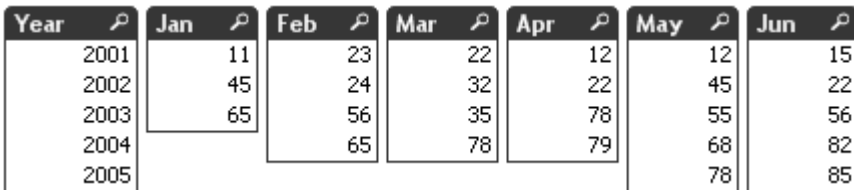
The following statement has been generated in your script:

```

Load      Year,
          Jan,
          Feb,
          Mar,
          Apr,
          May,
          Jun
FROM      [Data Sources\Crosstable1.csv]
          (txt, codepage is 1252, embedded labels, delimiter is
          ', ', msq); )

```

- 6 Load the script by clicking **Reload**.
- 7 In the dialog **Sheet Properties** that now opens, add all the fields except the system fields to the **Fields Displayed in Listboxes**.
- 8 Click **OK**. The following list boxes appear on your screen:



Year	Jan	Feb	Mar	Apr	May	Jun
2001	11	23	22	12	12	15
2002	45	24	32	22	45	22
2003	65	56	35	78	55	56
2004		65	78	79	68	82
2005					78	85

Figure 70. The resulting list boxes

- 9 This is not what you want. Open the **Edit Script** dialog box again.
- 10 Now add the **crosstable** prefix, indicating that the table is to be loaded as a cross table, to your **load** statement. The **crosstable** prefix should be followed by a parenthesis containing the names you wish to apply to the new fields:

```

Crosstable(Month,Sales) LOAD Year,
          Jan,
          Feb,
          Mar,
          Apr,
          May,
          Jun
from [Data Sources\Crosstable.csv]
          (txt, codepage is 1252, embedded labels, delimiter is
          ', ', msq); )

```

- 11 Click **Reload**. The **Fields** dialog page of the **Sheet Properties** dialog opens. Move the fields *Month* and *Sales* to the column of displayed fields (the field *Year* is already there), then click **OK**.

The following list boxes appear on your screen:

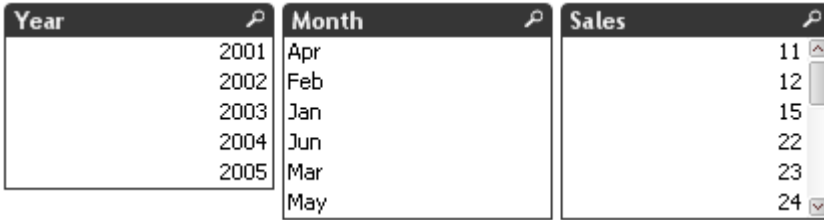


Figure 71. The list boxes when the script has been run with the crosstable prefix.

This distribution of values makes a lot more sense. To change the sort order and number of columns shown in the list boxes, see the chapter about “list boxes and statistics boxes” on page 51.

- 12 If you like, you can remove the obsolete (now empty) listboxes.
- 13 Save the document, then close it.

Loading a cross table with more than one regular column

The cross table is often preceded by a number of regular columns, which should be loaded in a straightforward way. This is the case in the following table (*Crosstable2.csv*):

Salesman	Year	Jan	Feb	Mar	Apr	May	Jun
A	2001	45	65	78	12	78	22
A	2002	11	23	22	22	45	85
A	2003	65	56	22	79	12	56
A	2004	45	24	32	78	55	15
A	2005	45	56	35	78	68	82
B	2001	57	77	90	24	90	34
B	2002	23	35	34	34	57	97
B	2003	77	68	34	91	24	68
B	2004	57	36	44	90	67	27
B	2005	57	68	47	90	80	94

Figure 72. *Crosstable2.csv*

In this table the matrix columns are preceded by two regular columns. You would probably like QlikView to show the contents of the table in four fields:

- *Salesman*, containing the values of the first (regular) column

- *Year*, containing the values of the second (regular) column
- *Month*, containing the headers of the remaining columns
- *Sales*, containing the values of the remaining columns

To obtain this result, do the following:

- 1 Choose **New** from the **File** menu.
- 2 Open the **Edit Script** dialog.

Click **Table Files**, then find the file *Crosstable2.csv* and click **Open**. The **File Wizard: Type** page opens. We will use this wizard to create the crosstable statement.

- 3 Click **Next >**, twice. This will take you to the **File Wizard: Options** page.
- 4 Click the **Crosstable** button. The **CrossTable** wizard opens.
- 5 Under **Qualifier Fields**, enter the number of qualifier fields that precede the table to be transformed.
- 6 Under **Attribute Name**, enter the name of the new field that will contain the month names. Type *Month*.
- 7 Under **Data Name**, i.e. the field that combines the sales figures, type *Sales* and click **OK**. In the preview pane you can now see the transformed table.

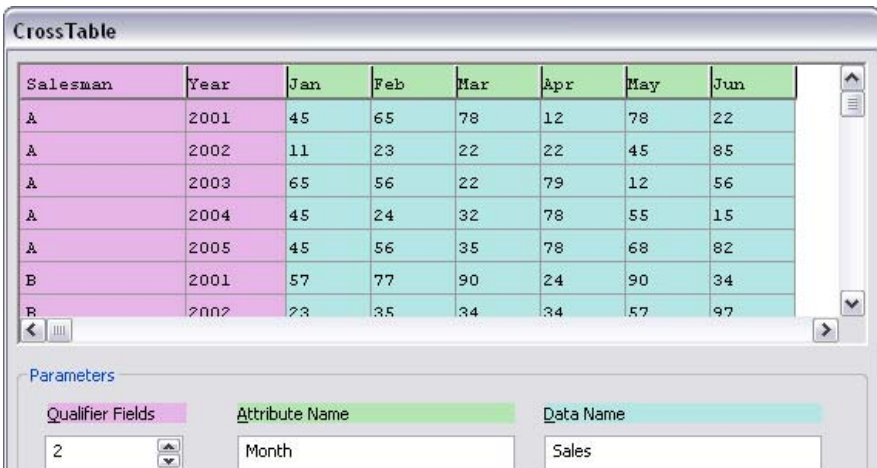


Figure 73. The CrossTable wizard uses color coding for the different field types.

Salesman <input checked="" type="checkbox"/>	Year <input checked="" type="checkbox"/>	Month <input checked="" type="checkbox"/>	Sales <input checked="" type="checkbox"/>
A	2001	Jan	45
A	2001	Feb	65
A	2001	Mar	78
A	2001	Apr	12
A	2001	May	78
A	2001	Jun	22
A	2002	Jan	11
A	2002	Feb	23

Figure 74. The transformed table in the File Wizard

- 8 Click **Finish**. The script generated should look as follows:

```

CROSTABLE(Month, Sales, 2)
Load Salesman,
Year,
Jan,
Feb,
Mar,
Apr,
May,
Jun
FROM [Data Sources\Crosstable2.csv] (txt, codepage is
1252, embedded labels, delimiter is ',', msq); )

```

Note that the crosstable prefix has the number 2 as a third parameter. This indicates the number of regular columns in the original table. If no parameter is stated, 1 is assumed.

- 9 Click **Save** to save your new script, then **Reload**. You are prompted to save the QlikView document. Name it something like *Crosstable2.qvw* and save it in the same folder as the other Tutorial files.
- 10 The **Fields** page of the **Sheet Properties** dialog opens. Move the fields *Salesman*, *Year*, *Month* and *Sales* to the column of displayed fields, then click **OK**.

The following list boxes appear on your screen:

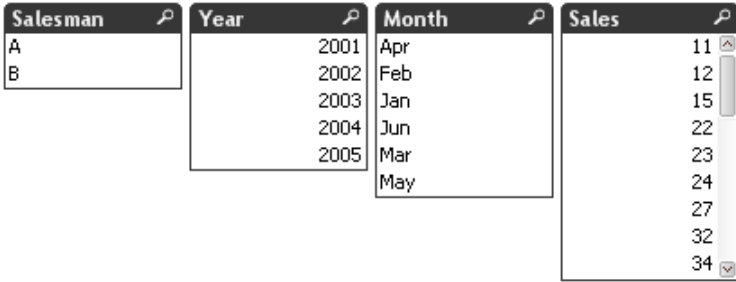


Figure 75. The resulting list boxes

- 11 Save the document, then close it. If you won't be working with QlikView for a while, you can also exit the program.

For a more detailed description of the syntax, see the *Reference Manual*.

LESSON 21 AND-MODE IN A LIST BOX

Two selections in different list boxes are always interpreted as logical **and**, i.e. QlikView will show all the field values associated with both the selections. A multiple selection within a list box is however usually interpreted as logical **or**, i.e. QlikView will show data entries associated with *any* of the selected values.

Under some circumstances, a multiple selection within a list box can be set to logical **and**, which means that QlikView will show only data entries associated with *all* of the selected values.

This lesson features a list box set to **and**-mode, which you will use for usual selections as well as for **not**-selections. You'll also learn under which circumstances a list box can be set to **and**-mode.

Making an and-selection

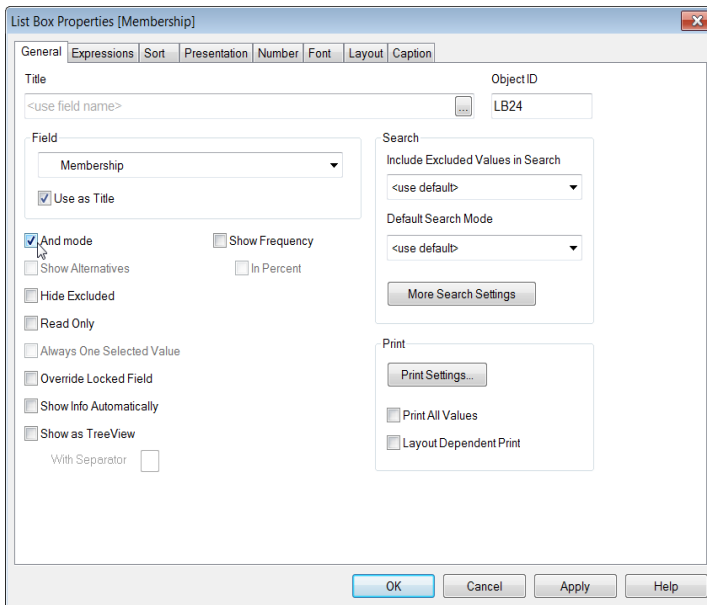


Figure 76. The List Box Properties sheet in which the **and** mode can be set

In the file *And.qvw* in the `..\Tutorial\Advanced` directory, there is such a list box:

1 Start QlikView.



-
- 2 Open the file *And.qvw*.
 - 3 Choose the tab *Geography*, and find the list box *Membership*.

This is a list of organizations and geographical areas that the different countries belong to. A country can be a member of several organizations, and an organization can have many members. There is thus a many-to-many relationship between the field *Country* and the field *Membership*. Moreover, the field *Membership* does not link directly to any other field but *Country*. Under such circumstances, the field *Membership* can be set to **and** mode. A multiple selection in the *Membership* field should then be interpreted as "show only countries that are members of all the selected organizations".

- 4 Click on the list box with the right mouse button, then choose **Properties, General**.
- 5 Mark the check box **And mode**, then choose the **OK** button.
- 6 Select *Europe* by clicking it.

The *Europe* cell should now be green, and have an ampersand "&" to the left. The organizations shown as alternatives (white) are the ones that have one or several members of Europe. The organizations that are excluded are the ones with no members on the European continent.

- 7 Select *G-7* by CTRL-clicking.

You have now selected Europe *and* G-7, i.e. countries that are members of both. Only four countries remain optional, and these are all European countries in the G-7 group.

Making a not selection

It is also possible to exclude countries in a similar way:

- 1 Deselect *G-7* by CTRL-clicking it.
- 2 Select *G-7* by CTRL-clicking it, keeping the mouse button down. Release the button when the cell has turned red.

You have now selected Europe and *not* G-7. Only European countries not in the G-7 group are now optional. This type of selection is called forced exclusion, and is very useful in many-to-many relationships.

- 3 Close the file. If you won't be working with QlikView for a while, you can also exit the program.



Characteristics of the and table

	A	B	C	D
1	Country	Membership		
2	Russia	Europe		
3	Russia	Prev. Soviet Rep.		
4	Russia	Asia		
5	Liechtenstein	Europe		
6	Canada	OECD		
7	Canada	North America		
8	Canada	G-7		
9	Canada	NATO		
10	Canada	NAFTA		
11	Argentina	South America		
12	China	Asia		
13	Chile	South America		
14	U.S.A.	ANZUS		
15	U.S.A.	OECD		
16	U.S.A.	North America		
17	U.S.A.	G-7		
18	U.S.A.	NATO		
19	U.S.A.	NAFTA		
20	Malaysia	Asia		
21	Malaysia	ASEAN		
22	Brazil	South America		
23	Lebanon	Asia		
24	Lebanon	Middle east		
25	Australia	ANZUS		
26	Australia	OECD		
27	Australia	Australia & Pacific		

Figure 77. An and-table

Not every field can be set to logical **and** mode. The **and** mode is only possible if the field corresponds to the second column of a two-column table.

Also, the field must not be fetched from more than one table. The reason for this is that the **and**-alternative is logically meaningful only if the concerned field is associated to only one other field.

Finally, there must be no duplicate records in the table. Therefore this kind of table is always loaded using the **distinct** predicate (see the *Reference Manual*).

If the field is loaded this way, the **And mode** control in the **List Box Properties** dialog will no longer be dimmed and the logical mode of the list box can be changed.



LESSON 22 NUMBER FORMATS

QlikView can handle text strings, numbers, dates, times, time stamps and currencies correctly. They can be sorted, displayed in a number of different formats and they can be used in calculations. This means e.g. that dates, times and time stamps can be added to or subtracted from each other.

This lesson deals with the basics of number interpretation and number formatting. For more detailed information, see the *Reference Manual*.

Interpretation and formatting

The issue of obtaining correct number formats is really a question of two different things:

- Interpretation of data when it is loaded
- Display of different number-based data types

Data representation inside QlikView

In order to understand data interpretation and number formatting in QlikView, it is necessary to know how data is stored internally by the program. All of the data loaded into QlikView is stored in two representations, as a string and as a number.

- 1 The string representation is always available and is what is shown in the list boxes and the other sheet objects. Formatting of data in list boxes (number format) only affects the string representation.
- 2 The number representation is only available when the data can be interpreted as a valid number. The number representation is used for all numeric calculations and for numeric sorting.

If several data items read into one field have the same number representation, they will all be treated as the same value and will all share the first string representation encountered. Example: The numbers 1.0, 1 and 1.000 read in that order will all have the number representation 1 and the initial string representation 1.0.

Interpretation of data

QlikView tries to interpret input data as a number, date, time etc. As long as the system default settings (found under **Regional Options** in Windows 2000 or **Regional and Language Options** in Windows XP in the Control Panel) are used in the data

and the number interpretation variables in the script are correctly defined, the interpretation and the display formatting are handled automatically by QlikView, and the user does not need to alter the script or any setting in QlikView.

- 1 Open the Explorer and find the file *Date1.csv* in the *..\Tutorial\Advanced\Data Sources* directory. Double-click the file.
- 2 Excel opens the file. It consists of three fields, *Date*, *Customer* and *Sales*. Note that the dates in the *Date* field are formatted according to the American standard format M/D/YY (M=month, D=day, YY=the two final numbers of the year), and that the numbers in the sales field have comma as thousands separator.
- 3 Close the file.
- 4 Start QlikView, then choose **New** from the **File** menu. Save the document in the *Advanced* folder.
- 5 Open the **Edit Script** dialog. A certain number of **set** statements, defining separators and number formats via the number interpretation variables, have been generated automatically:

```
SET ThousandSep=',';
SET DecimalSep='.';
SET MoneyThousandSep=',';
SET MoneyDecimalSep='.';
SET MoneyFormat='$#,##0.00;($#,##0.00)';
SET TimeFormat='hh:mm:ss';
SET DateFormat='M/D/YY';
SET TimestampFormat='M/D/YY th:mm:ss[.fff]';
SET MonthNames='Jan;Feb;Mar;Apr;May;Jun;...';
SET DayNames='Mon;Tue;Wed;Thu;Fri;Sat;Sun';
```

These settings are taken from the regional settings in the computer on which the script is generated and could therefore look somewhat different on your computer. This ensures a correct reexecution of the QlikView script also on computers with other regional settings, provided that the data files remain the same.

- 6 Open the Control Panel (**Start** menu, **Settings**) and go to **Regional Settings**.
- 7 Look through the pages of the **Regional Settings** dialog, especially **Number** and **Date**, and note that the settings correspond to those defined by the variables above. To get the same results as this example, English (United States) must be chosen on the first page.
- 8 Close the Control Panel.

The number interpretation variables may be deleted, edited or duplicated freely. If changed, they substitute the operating system defaults.

Note that the thousands separator and the date format defined by the number interpretation variables also correspond to the formats used in your file. QlikView will thus interpret everything correctly:

- 9 Go back to QlikView and click **Table Files** in the **Edit Script** dialog.
- 10 Find the file *Date1.csv*, then click **Open**.
- 11 If the file wizard has made a correct interpretation of the contents, click **Finish**.
- 12 Click **Reload** to execute the script. You are prompted to save the document. Name it *Number.qvw* and save it in the same folder as your other Tutorial files.
- 13 Move the fields *Customer*, *Date* and *Sales* to the column of displayed fields, then click **OK**.
- 14 The three list boxes appear on your sheet. Move and size them.

There is an easy way to find out if QlikView has interpreted the contents as valid numbers: valid numbers are always right-aligned in the list box, whereas values interpreted merely as text strings are left-aligned.

The contents of both *Sales* and *Date* being right-aligned, you can conclude that they have been correctly interpreted.

- 15 Save the document and close it.

Once QlikView has interpreted the data as valid numbers, you can apply other formats using the **Number** page in the **List Box Properties** dialog. Formatting will be treated in the section “Formatting of data” on page 214.

Changing the number interpretation format

Suppose that the values of the field *Date* have the British date format (DD/MM/YY) instead of the American, i.e. a format that differs from the system settings and the formats set at the beginning of the script:

- 1 Click the **New** button to create a blank document. Save the document in the *Advanced* folder.
- 2 Open the **Edit Script** dialog, then click **Table Files**.
- 3 Find the file *Date2.csv*, then click **Open**.
- 4 If the file wizard has made a correct interpretation of the contents, click **Finish**.

-
- 5 Click **Reload** to execute the script. You are prompted to save the document. Name it *Number2* and save it in the same folder as your other Tutorial files.
 - 6 Move the fields *Customer*, *Date* and *Sales* to the column of displayed fields, then click **OK**.
 - 7 The three list boxes appear on your sheet. Move and size them.

This time, the values of the *Date* list box are left-aligned, which means that they have been interpreted as text strings, not as valid dates. As long as this situation remains, you won't be able to change the number format of the field, nor make calculations based on the field.

The problem can be solved in one of the following ways:

- By changing the system settings in the Control Panel
- By changing the date format setting in the script
- By using an interpretation function in the script

Changing the date format in the script

Changing the system settings is usually not a good idea, unless most of the files you load have a type of regional settings that is different from yours. Changing the date format setting in the script is a better solution (moreover, it is very useful if you want a person with different system settings to use the document):

- 1 Open the **Edit Script** dialog of your file *Number2.qvw*. Change the date format setting to DD/MM/YY. The **set** statements should now be the following:

```
SET ThousandSep=', ';
SET DecimalSep='.';
SET MoneyThousandSep=' ';
SET MoneyDecimalSep='.';
SET MoneyFormat='$# ##0.00; ($# ##0.00)';
SET TimeFormat='th:mm:ss';
SET DateFormat='DD/MM/YY';
SET TimestampFormat='M/D/YY th:mm:ss[.fff]';
SET MonthNames='Jan;Feb;Mar;Apr;May;Jun;...';
SET DayNames='Mon;Tue;Wed;Thu;Fri;Sat;Sun';
```

- 2 Reexecute the script by clicking **Reload**.
- 3 Click **OK** to close the dialog, then study your document and note that the values in the list box *Date* are now right-aligned. They have thus been interpreted as valid dates.

- 4 Save the document and close it.

Using interpretation functions

If you load several files which all have different number formats, you may want to use an interpretation function instead. Interpretation functions are used to interpret field contents or expressions. Do the following:

- 1 Create a blank document by clicking **New**.
- 2 Open the **Edit Script** dialog. Note that the date format is M/D/YY again, since you haven't changed the system settings.
- 3 Click **Table Files** and open the file *Date2.csv*.
- 4 If the file wizard has made a correct interpretation of the contents, click **Finish**.
- 5 Modify the script to make it look like below:

```
Load date#(Date, 'DD/MM/YY') as Date,
      Customer,
      Sales
from [Data Sources\Date2.csv]
(txt, codepage is 1252, embedded labels, delimiter is
',', msq); )
```

Date# is the interpretation function, *Date* is the field to be interpreted, and DD/MM/YY is the date format according to which you want the field contents to be interpreted. The syntax, as well as further examples, are found in the *Reference Manual*.

- 6 Choose **Reload** to execute the script. You are prompted to save the document. Name it *Number3.qvw* and save it in the same folder as your other Tutorial files.
- 7 Move the fields *Customer*, *Date* and *Sales* to the column of displayed fields, then click **OK**.
Study the document and note that the values of the field *Date* have once again been interpreted as valid dates. The result is identical with the one of *Number2.qvw*.
- 8 Save the document.

Interpretation problems due to different separators are solved in the same way.

Note When interpreting dates with only two positions for year, e.g. YY-MM-DD, QlikView will assume that the date falls within a moving

window of -50 to +49 years counted from the current year according to the system clock. Thus, 88-08-08 will be interpreted as 1988-08-08, whereas 44-08-08 will be interpreted as 2044-08-08.

Files are not always homogeneous. If you have a file containing differently formatted data in one and the same field, you can use the **alt** function, which tests if the field contains data formatted according to the specified number representations. See the *Reference Manual*.

Formatting of data

Once QlikView has interpreted data as valid numbers, it is possible to choose another number format in the properties dialog for the sheet object.

- 1 Click on the list box *Date* with the right mouse button, then choose **Properties...** from the float menu.
- 2 Go to the **Number** page.
- 3 Choose **Override Document Settings** in order to set a separate number format for the list box.
- 4 The format is set to **Number**. Change it to **Date** by marking the checkbox.
- 5 In the **Format** box, the default date format of the operating system appears. It can be changed to any other format of your choice. For instance, you may prefer the standard ISO format YYYY-MM-DD. Erase the contents of the **Format** box and enter the new format, or click the **ISO** button.
- 6 Click **OK**.

The specified format has been applied to the values of the list box *Date*. To choose another date format, simply open the **Number** page of the properties dialog again and change the contents of the **Format** box.

The easiest way to change the number format for several fields is to use the **Document Properties** dialog.

If the field originally contained differently formatted values, e.g. certain dates with the format M/D/YY and others with the format DD/MM/YY, you may want to return to the original formatting. For ordinary text files, however, this is only possible if the script is re-executed with the **Survive Reload** check box (**Number** page) deselected.

The **Default from input** button on the **Number** page is only available for fields with a defined data type read from a database via ODBC.

7 Save and close the document. If you won't be working with QlikView for a while, you can also exit the program.

It is also possible to set the formatting by using formatting functions in the script. See the *Reference Manual*.

For more detailed information about number formats, see the *Reference Manual*.



LESSON 23 SECURITY

It is important that information is distributed only to those who have rights to see it. Since QlikView makes the previously cumbersome process of retrieving information a very simple task, it is obvious that a mechanism that handles security issues is necessary. In this lesson, which is the last lesson of the *Tutorial*, you'll add an access restriction mechanism to a previously created file.

Sections in the Script

Access control is managed via one or several security tables loaded in the same way as QlikView normally loads data. It is thus possible to store these tables in a normal database. The script statements managing the security tables are given within the access section, which in the script is initiated by the statement `section access`, see the Reference Manual.

If an access section is defined in the script, the part of the script loading the “normal” data must be put in a different section, initiated by the statement `section application`

Access levels

Access to QlikView documents can be authorized to specified users or groups of users. In the security table, users are assigned the access levels ADMIN or USER. If no access level is assigned, the user cannot open the QlikView document.

A person with ADMIN access can change everything in the document. Using the **Security** page in the **Document Properties** and **Sheet Properties** dialogs, a person with ADMIN access can limit the users' possibilities of modifying the document. Read more about this in the Reference Manual. A person with USER privileges cannot access the **Security** pages.

Example:

```
Section Access;
Load * inline
    [ACCESS,USERID,PASSWORD
    ADMIN, A,X
    USER,U,Y ];
Section Application;
Load ... from ...
```

Section Access system fields

The access levels are assigned to users in one or several tables loaded within the section access. These tables can contain several different system fields, typically USERID and PASSWORD or NTNAME, and the field defining the access level, ACCESS. The full set of section access system fields are described in the reference manual. Other fields like e.g. GROUP or ORGANISATION may be added to facilitate the administration, but QlikView does not treat these fields in any special way.

None, all, or any combination of the security fields may be loaded in the access section. However, if the ACCESS field is not loaded, the section access will really not be meaningful.

ACCESS

A field that defines what access the corresponding user should have.

USERID

A field that should contain an accepted user ID. QlikView will prompt for a User ID and compare to the value in this field. This user ID is not the same as the Windows user ID.

PASSWORD

A field that should contain an accepted password. QlikView will prompt for a Password and compare to the value in this field. This password is not the same as the Windows password.

SERIAL

A field that should contain a number corresponding to the QlikView serial number (license key). Example: 4900 2394 7113 7304. QlikView will check the license key of the user and compare it to the value in this field.

NTNAME

A field that should contain a string corresponding to a Windows NT Domain user name or group name. QlikView will fetch the logon information from the operating system and compare it to the value in this field.

QlikView will first compare the QlikView license key with the field SERIAL. After this it will ask the operating system who is logged on. It will then, if necessary, prompt for User ID and password and compare these with the fields USERID and PASSWORD

If the combination of Windows User ID, QlikView User ID, QlikView password and license key (serial number) is found in the Section Access table, the document is opened with the corresponding access level. If not, QlikView will deny the user access to the document. If the User ID and/or the password are not entered correctly within three attempts the entire log-on procedure must be repeated.

Example 1:

Only serial number (license key) is checked. One specific computer gets ADMIN access. Everyone else gets USER access. Note that a star can be used to mark “any license key”.

ACCESS	SERIAL
ADMIN	4900 2394 7113 7304
USER	*

Example 2:

The administrator and the computer with license key “4900 2394 7113 7304” (the server on which QlikView runs as a batch job) gets ADMIN access. Everyone else gets USER access when entering “USER” as user ID and password.

ACCESS	SERIAL	USERID	PASSWORD
ADMIN	*	ADMIN	ADMIN
ADMIN	4900 2394 7113 7304	*	*
USER	*	USER	USER

Note Before you start this exercise, you should take a backup of the file you intend to use. The smallest mistake in the security table could make it impossible to open the file again.

Loading security tables

Suppose you have two tables containing security information, the first one named *acclist.csv*, the second *accserid.csv*. The first table contains the security fields *USERID*, *PASSWORD* and *ACCESS*, the second the security field *SERIAL*. Since the same associative logic that is the hallmark of QlikView is used also in the access section, the tables will be associated via the optional field *COMPUTER NAME*.

Note All fields listed in **Load** or **Select** statements in the section access must be written in UPPER CASE. Any field name containing lower case letters in the database will be converted to upper case before being read by the **Load** or

Select statement. However, the user ID and the password entered by the end-user opening the QlikView document are case insensitive..

USERID	PASSWORD	ACCESS	GROUP	COMPUTER NAME
Sharon	7VFIIR	ADMIN	IT	All
Sharon	FROMME2U	USER	IT	All
Bob	LOVE15	ADMIN	Marketing	Bob
Bob	15ALL	USER	Marketing	All
Pete	NUMBER1	USER	Personnel	All
Sarah	ABSOLUT	USER	Personnel	Sarah

COMPUTER NAME	SERIAL
Sharon	1234 5678 9012 3456
Bob	1234 5678 9012 3457
Pete	1234 5678 9012 3458
Sarah	1234 5678 9012 3459
All	*

Note The license key must be given in 4x4 number groups separated by a blank.

You'll now load the above tables into QlikView:

- 1 Open the document for which you want access control, e.g. *Advanced.qvw*.
- 2 Save the file as *Access.qvw*.
- 3 Open the **Edit Script** dialog and position the cursor at the beginning of the script, but after the **set** statements.
- 4 Click **Table Files**.
- 5 Select the files *acclist.csv* and *accserid.csv* (in the *..\Tutorial\Advanced\Data Sources* directory) and click **Open**.
- 6 The files are opened in the file wizard. Click **Finish** for both files.
- 7 For the tables to be used for access control, the statements loading them need to be placed in a separate section. Type **section access;** at the top of the script (after the **set** statements). Don't forget the semicolon.
- 8 To distinguish the access section from the application section, position the cursor after the statements loading the security tables, then type **section application;**. Don't forget the semicolons: they indicate the end of a statement.

The first part of your script should now have the following appearance:

```

Section access;
Directory;
Load      USERID,
          PASSWORD,
          ACCESS,
          GROUP,
          [COMPUTER NAME]
FROM [Data Sources\ACCLIST.CSV]
(txt, codepage is 1252, embedded labels, delimiter is
',', msq); )

Load      [COMPUTER NAME],
          SERIAL
FROM [Data Sources\ACCSERID.CSV]
(txt, codepage is 1252, embedded labels, delimiter is
',', msq); )

Section application;
Load Country,
      Capital,...

```

The **directory** statement specifies the path to the files.

- 9 Choose **Reload** to execute the script.
- 10 Click **OK** to close the dialog.

The following access rights will be granted:

- | | |
|--------|--|
| Sharon | will have access rights from all the computers (since all the license keys are allowed). Depending on which password she uses she will be granted either ADMIN or USER access rights. |
| Bob | will have ADMIN rights when he sits at his own computer (license key “1234 5678 9012 3457”) and enters his UserID (Bob) and Password (LOVE15). He will have USER rights on all the computers (all license keys allowed) when he gives his UserID (Bob) and Password (15ALL). |
| Pete | will have USER access from all the computers provided he gives his UserID and correct password, and |
| Sarah | will have to use her own computer (License key “1234 5678 9012 3459”) and give a correct UserID and Password to be able to open the QlikView document with USER access rights. |

Using the Security pages

People with ADMIN privileges can prevent the execution of certain commands:

1 Choose **Document Properties** from the **Settings** menu.

2 Go to the **Security** page.

The **Security** page contains a list of QlikView commands. By deselecting a check box, you prevent the document users from executing that command.

3 Deselect **Add Sheets** and **Edit Script**, then click **OK**.

Note that the commands you deselected are now dimmed, i.e. inactive.

4 Save the file as `Access.qvw`, then close it and exit QlikView.

There is also a **Security** page in the **Sheet Properties** dialog, containing further commands

Working with access restriction

Suppose you are Pete and wish to work with the document.

1 Open QlikView, then choose **Open** from the **File** menu.

2 Find the file `Access.qvw` and click **Open**.

3 QlikView prompts for the correct User ID. Enter *Pete*, then click **OK**.

4 QlikView now prompts for the correct password. As Pete, you have USER rights from all the computers. Enter your password, i.e. *NUMBER1* (case insensitive). Click **OK**.

If you have done everything correctly, the document now opens and you can work with it. Note, however, that you cannot add sheets or view the script, since these commands have been inactivated. Note also that you cannot access the **Security** pages: these pages are only available for ADMIN users.

If you wish to be granted access to all the parts of the document, you need to enter Sharon's UserID and Password (make sure to pick the password granting her ADMIN access rights).

5 Close the file. If you won't be working with QlikView for a while, you can also exit the program.

The syntax of the **section** statement is given in the *Reference Manual*. For further information on access restriction, see the Appendix of that manual.

You have now finished the entire *Tutorial*. As you create your own documents, be sure to take advantage of all the resources available to you. For further information, see the *Reference Manual*.



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