

Data Visualisation

Qlik Sense®

Contents

Contents

	<i>Slide</i>
<i>Visualisation process</i>	6
<i>Introduction to Qlik Sense[®]</i>	15
<i>Installation process</i>	19
<i>Qlik Sense[®] basics</i>	21
<i>Qlik Sense[®] user interface</i>	47
<i>Hands on exercise - CORDIS</i>	58
<i>Qlik Sense[®] other features</i>	118
<i>Hands on exercise – Problem Solving</i>	122
<i>Individual projects & Presentation</i>	133

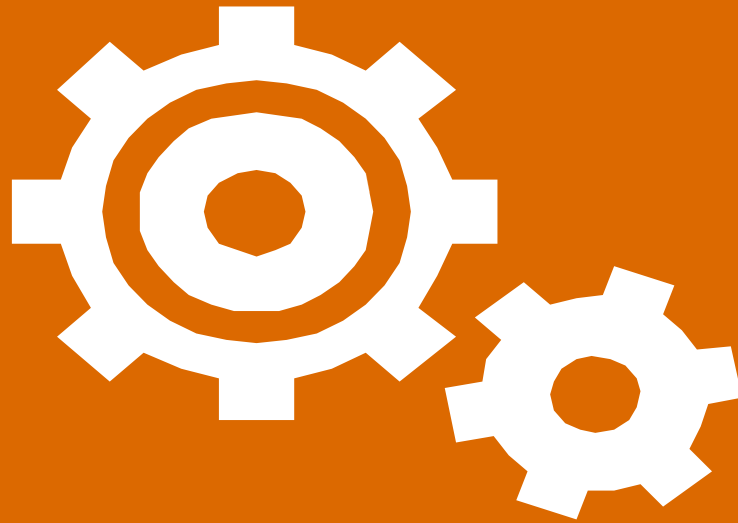
Roundtable and introductions



Roundtable and introductions

- Who am I?
 - Name
 - Business
 - Etc.
- Which data am I working with?
- What experience do I have with Qlik Sense or other visualisation tool?
- What would I like to learn?

Visualisation process



Visualisation Process

Different stages of visualisation

- Good visualisation is about making good decisions.
- To make the best decisions you need to be **familiar with all your options** and aware of the things that will influence your choices.
- In order to end up with a satisfying result in data visualisation, it is important to follow a step-by-step process approach in order not to overlook any relevant options.
- There are four main stages of this process:



Visualisation Process

Different stages of visualisation

- When creating a visualisation, the first step should always be to clearly state the **question to be answered**.
- By being conscious of the answer we need, we can more effectively choose the **data required** to answer it.
- A common mistake is to dive head first into all the available data and end up losing the initial goal and over-complicating a rather simple process.

1



Visualisation Process

Different stages of visualisation

Collect Data

Before being able to visualize it is important to collect the data needed to answer the business question.

It is important to consider the following:

- What do we want to represent?
- Which variables contain this information?
- What type of variables are they?
- What are their properties (e.g. range)?

2

Collect and
prepare data

In this step we ensure that we have all the data we need in the right structure.

After collecting the data it is also best to do some **sense checks** on the data such as:

- How **accessible** is the data for all stakeholders?
- Is the content of the data still **valid**, **consistent** and **accurate**?
- Is the data **relevant** to my business question?
- Is the data in the **correct format** for my visualisation?
- Did we use the right **granularity** for all?
- Is my data set **complete**?

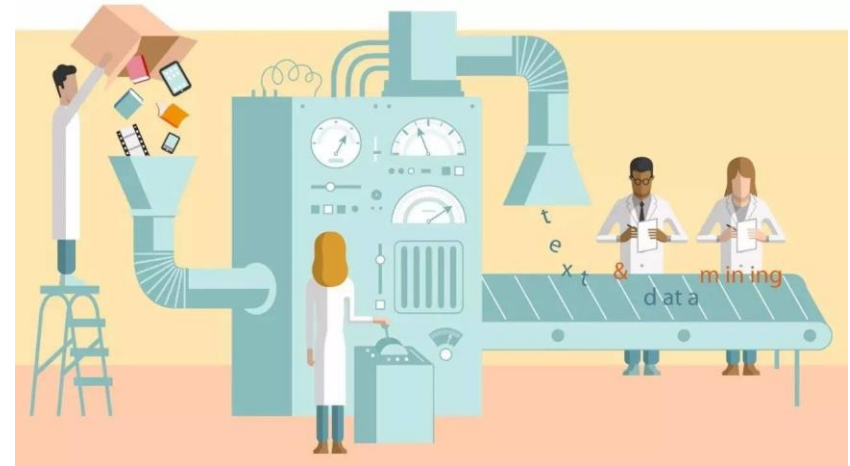
Visualisation Process

Different stages of visualisation

Prepare Data

After collection some additional data preparation might be required. Here it is important to check if amongst others:

- Additional computed variables need to be created
- Filtering on the data is needed
- Links between different datasets are required
- Etc.



2

Collect and
prepare data

Visualisation Process

Different stages of visualisation

When preparing or collecting data it is important to understand the **different types of data** available:

Quantitative



- Data dealing with **numbers**
- Data which can be **measured**
- Two types:
 - Categorical
 - Continuous
- E.g.: length, volume, speed, weight category, coordinates, etc.

Qualitative



- Data dealing with **descriptions**
- Data can be **observed** but not measured
- Data can be categorical only
- E.g. colours, mood, countries, etc.

2

Collect and
prepare data

Visualisation Process

Different stages of visualisation

Some examples:

Geospatial



- Data specifying a location in space and time
- E.g. Coordinates:

Lat: 51.0543, long: 3.7174

N 51 3'16", E 3 43'3"

2

Collect and
prepare data

Network



- Representing a hierarchical or non-hierarchical relationships/interactions between entities
- Examples include:
 - Graphs representing relationships between entities (e.g., FB friends);
 - Interactions (e.g., communication traces in social networks);
 - And hierarchies (e.g. taxonomies).
- E.g. linkedin data

Textual



- Data consisting of text
- Usually analysed to produce:
 - Text categorisation;
 - Text clustering;
 - Concept and pattern extraction;
 - Document summaries,
 - And sentiment analysis etc.
- Has to be “mined” before analysis
- E.g. Shakespeare (sonnet 18)

Visualisation Process

Different stages of visualisation

In order to choose a good medium a couple of questions should be asked. Some examples could be:

- Will the visualisation be **printed or digital**?
 - In print we have a set space that we can predefine, while digitally we have to take into account how it will look on different screen types and sizes.
 - In print the colour output can be tested and set, but digitally colours can appear differently from screen to screen, and ruin the outcome.
- Will it be **static or interactive**?
 - If it is static all we need to do is design a single layout. But if it's interactive we have to consider how elements change and how this affects the information conveyed and the aesthetics of the bigger picture.

3



Consider
medium

Visualisation Process

Different stages of visualisation

Now is it time to decide on the appearance of the visualisation itself.

The optimal visualisation design depends on two factors, primarily:

- the **message** to be conveyed to the audience or the question to be answered
- and the **variables** to be shown.

Different types of visualisation are available such as:

- Charts (barchart, linechart, piechart, etc.)
- Static powerpoints
- Interactive dashboards
- Pictures
- Infomercials
- Movies
- Etc.

4

**Develop visual
representation**

Introduction to Qlik Sense[®]

Introduction to Qlik Sense[®]

What is Qlik Sense[®]?



- Qlik Sense[®] is a **platform for visual data analysis**. It allows users to easily analyse data and uncover useful insights.
- It is highly **flexible** and aims to create actionable insights that can lead to meaningful impact.
- Qlik Sense[®] , allows to **share** this **knowledge** with others. It also provides the opportunity to analyse in groups or across different organisations.

Introduction to Qlik Sense[®]

What are the key strengths?

Interactive interface



- Easy handling of follow-up questions
- Allows for a dynamic iterative process

User empowerment



- Develop your own data visualizations
- Build dashboards on ad-hoc data sources
- Tailor-made solutions

Dynamic data management



- Flexibility in the use of data sources
- Open connection allowing continuous updates
- Data processed “in memory” increasing speed

Introduction to Qlik Sense[®]

What are the key strengths?

Mobile Friendly



- Responsive design
- Allows for visualizations and build on all mobile devices

Easy publication and collaboration



- Publish and share an app embedded in websites
- Qlik cloud
- Pdf or image exports
- Data exports in current states

Story telling feature



- Provides narration to enable clear communication
- Combines visualizations, reporting, presentation and analysis techniques

Qlik Sense[®] installation process

Qlik Sense[®] installation process

The software used for this workshop is **Qlik Sense[®] Desktop**.

To install it:

1. Navigate to the following website:
<http://www.qlik.com/try-or-buy/download-qlik-sense>
2. Fill in the form and click “Download Now”;
3. Once downloaded, run the installer and install the client.



Register to Download Qlik Sense Desktop

All fields required.

First Name Last Name

Phone

Business Email

Company

Job Title

Country

State/Region

Tell us about your relationship with Qlik

By accepting, I acknowledge that I have read the [Qlik Sense Desktop License Agreement](#).

Download Now

Please note that by submitting your personal data in this registration form, you consent to receiving electronic messages and other communications from Qlik. You may opt-out of receiving further communications at any time. For further information please see our [Privacy Policy](#).

QlikTech International AB and its Affiliates
Scheelevägen 24-26, SE-223 63 Lund, Sweden

Qlik Sense[®] basics

QlikSense[®] basics

Overview



Associative selection model

Selection colours

Apps

Sheets

Visualisations

Functions

Expressions

Dimensions

Measures

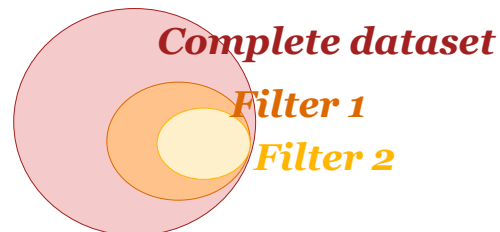
Master items

Seeking help

Qlik Sense[®] basics

Associative selection model

- Making selections is the **main interaction method** in Qlik Sense[®]. Selections filter out a subset of the data that is loaded into Qlik Sense[®].
- Selections are done by clicking on the visualisations.
- Multiple selections over different visualisations are connected with an **AND logical relationship**. This means that data displayed will be only that which fits all selections.






- This means that the more selections one makes the more he refines the focus of his selection.

Qlik Sense[®] basics

Selection colours

In Qlik Sense[®] there are three colours when it comes to selection:

-  indicates **selected** values;
-  indicates **associated** values;
-  indicates **non-associated** values.

WorldCountries.ShortName	projectAcronym
Afghanistan	BRIGAIID
Aland	EURAXESS TOP III
Albania	GEO-CRADLE
Algeria	INFORM
American Samoa	TraSaCu
Andorra	VI-SEEM
Angola	[e-POM-Bioanal]
Anguilla	1D-Neon
Antigua and Barb.	1stProposal
Argentina	2-IMMERSE
Armenia	2-NanoSi

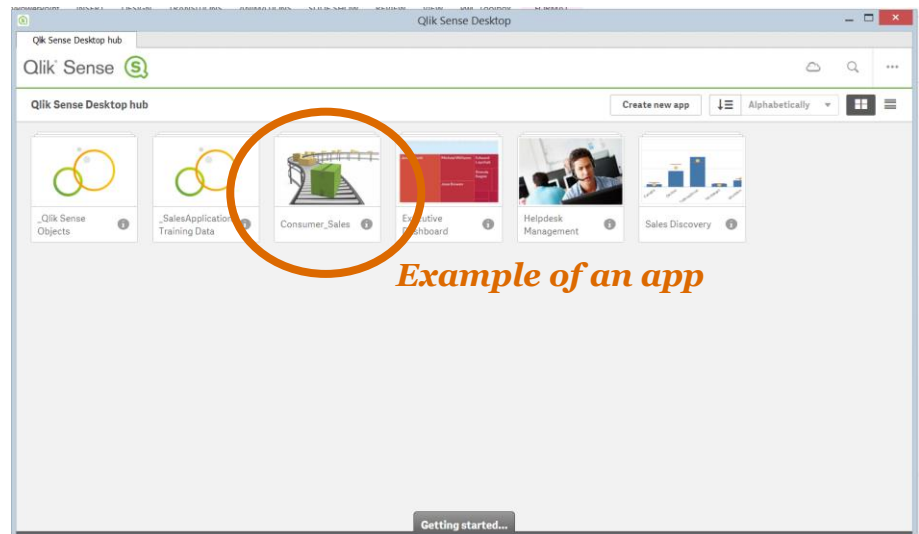
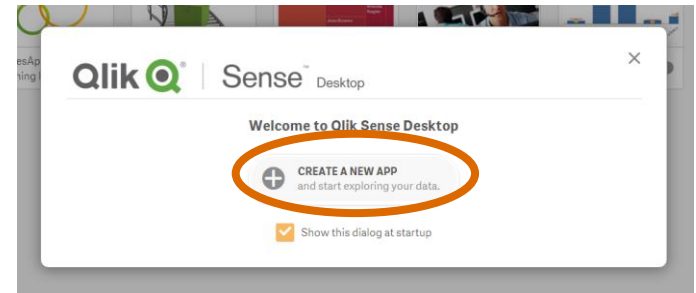
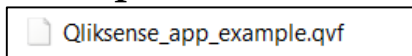
Qlik Sense[®] basics

Apps

- The main component of Qlik Sense[®] is the App.
- An app is made up of a combination of:
 - **Sheets containing data objects** (i.e. measures, dimensions, variables and visualisations);
 - **Bookmarks;**
 - and **Stories.**



- The app also includes the data needed to perform analysis in a structured data model.
- **Example file:**



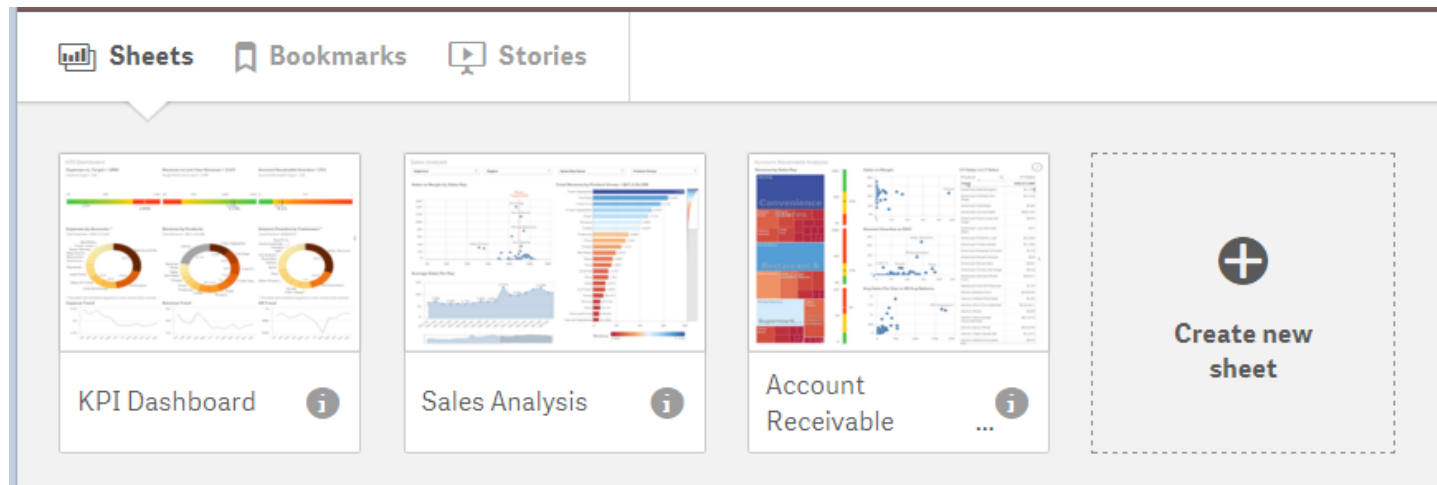
Qlik Sense[®] basics

Sheets

- A sheet is where the data objects are placed. An app can include several sheets.
- Every sheet can be viewed in its **edit** view for editing and its **done** view for exploration and analysis.



Remember! The various sheets in an app are connected to each other. This means that selections you make on one sheet affect the visualisations on the other sheets as well.



Qlik Sense[®] basics

Visualisations

Visualizations are used to present the data loaded in the app.

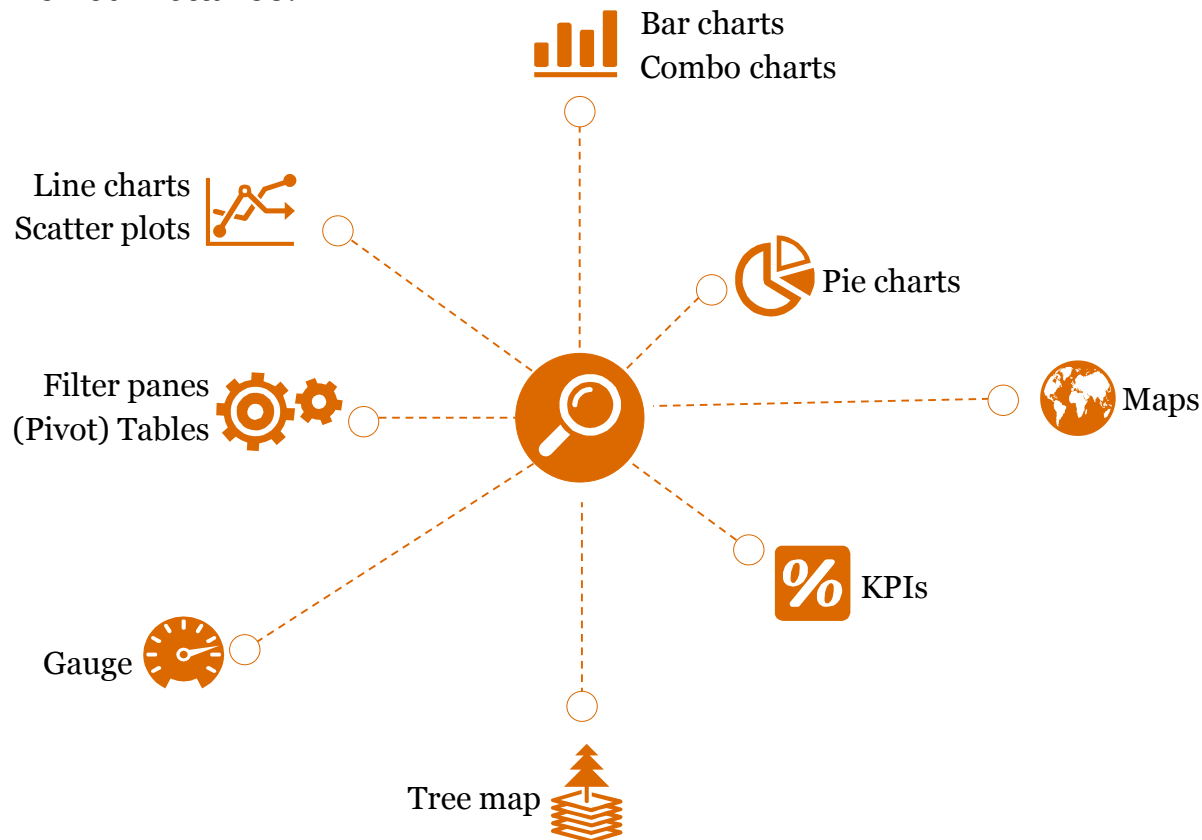
Qlik Sense[®] includes chart items which are what you use to create visualizations.

Often you can convert from one chart to another while keeping all values and data untouched. This helps when you want to view a visualisation from a different perspective.

Qlik Sense[®] basics

Visualisations

Qlik Sense[®] provides a diverse set of visualisation types to display data according to the needs of each circumstance.

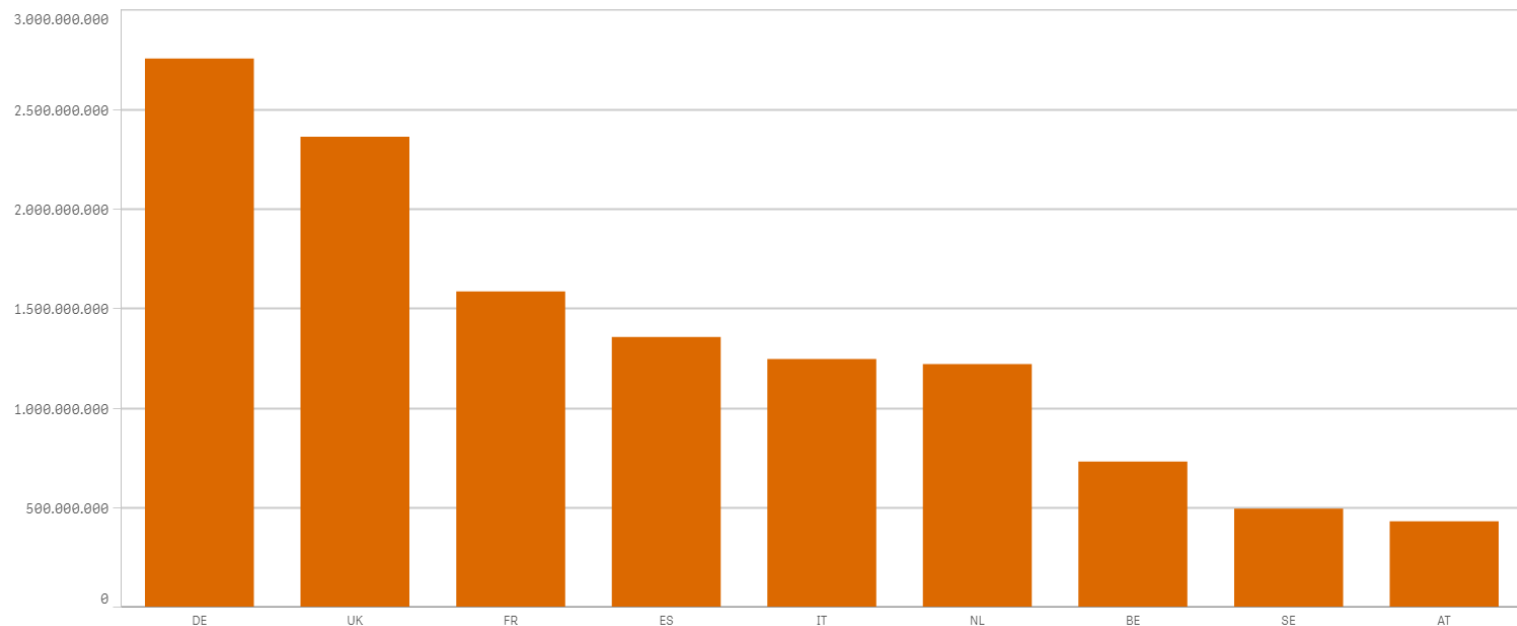


Qlik Sense[®] basics

Visualisations

Bar chart

- It is used to compare items and data over time.
- Grouping and stacking bars makes it easy to visualize more than one measures.
- It is used to visualise the different values of a measure in different categories.

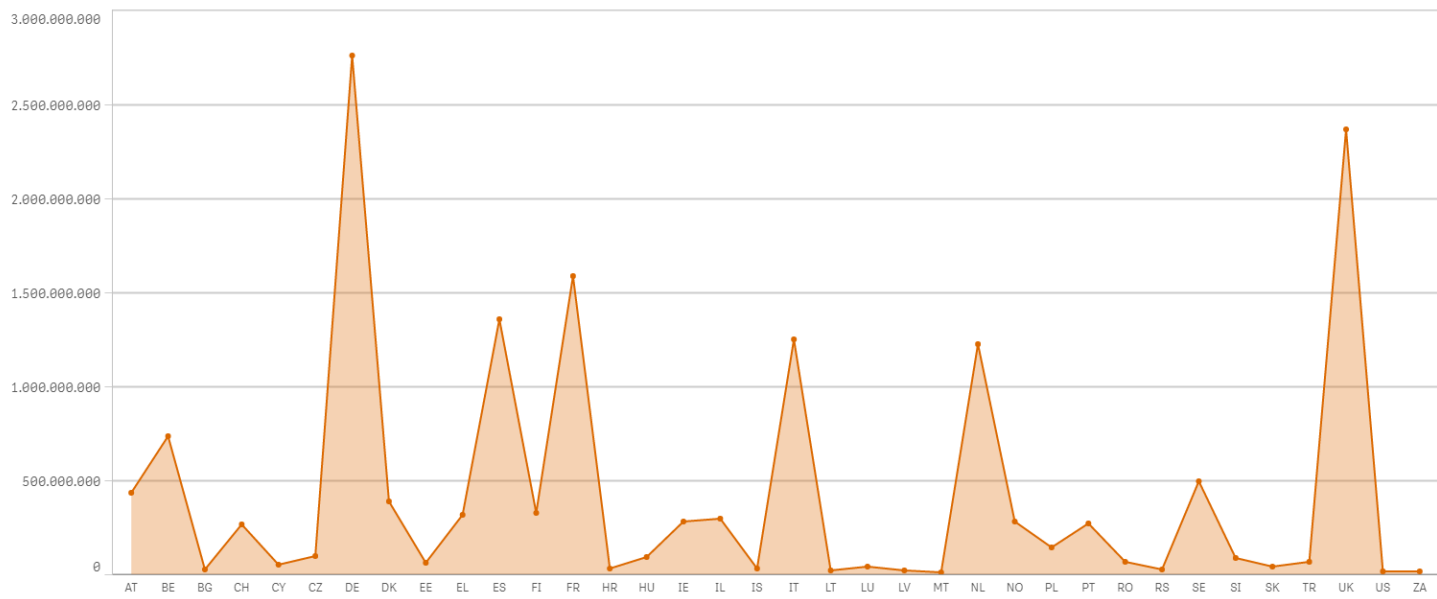


Qlik Sense® basics

Visualisations

Line chart

- It is used to display trends and compare changes over time. It is best used when the horizontal dimension is evenly spaced, such as the case with months, quarters, or fiscal years.

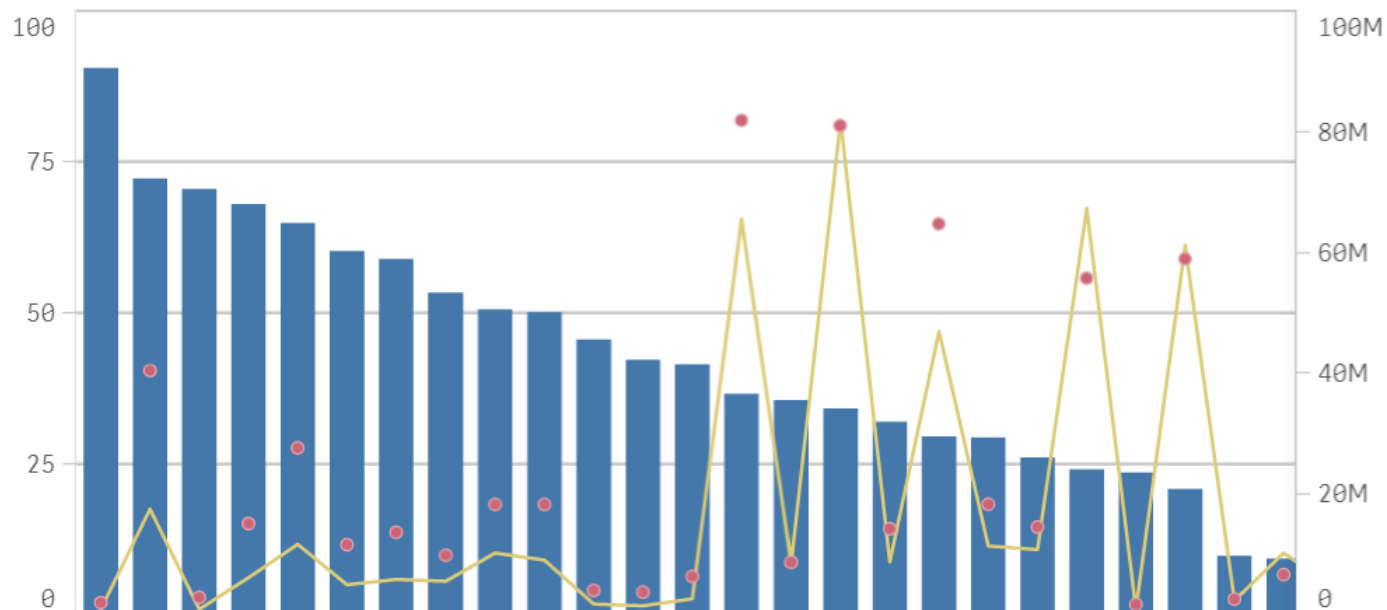


Qlik Sense[®] basics

Visualisations

Combo chart

- It combines absolute and relative values by combining features of the bar chart and the line chart.
- You can use bars and lines to represent different categorical groups in the same visualization.

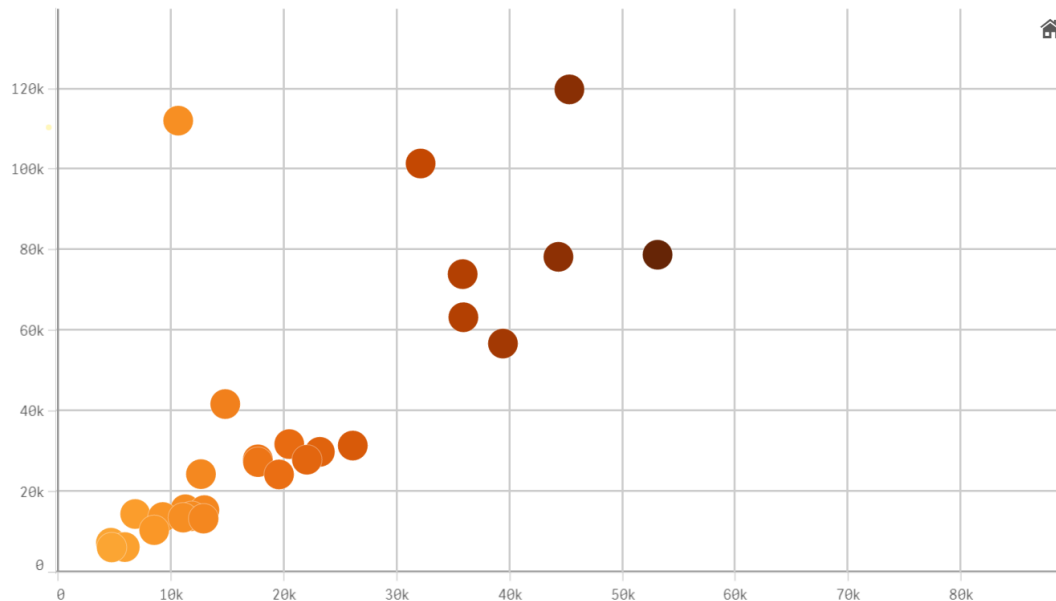


Qlik Sense[®] basics

Visualisations

Scatter plot

- It is best used when you are trying to display the distribution and relationship of a pair variables. The scatter plot helps detect potential relationships between values, and identify outliers in data sets.
- Additional information can be illustrated through the size and/or colour of the dots.

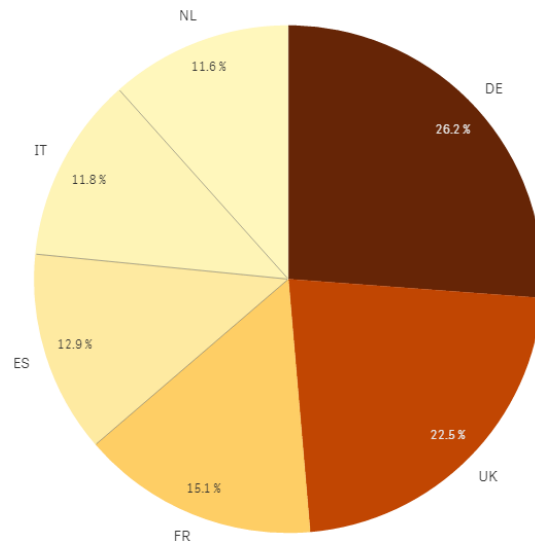


Qlik Sense[®] basics

Visualisations

Pie chart

- It is best used to display proportional data, and/or percentages.
- Since the pie chart represents the size relationship between the parts and the entire entity, the parts need to sum to a meaningful whole.
- It is best to avoid the pie chart when there are many values as it can easily become cluttered and unreadable.



Qlik Sense[®] basics

Visualisations

KPI – Key Performance Indicator

- It displays the state of key variables of an organisation.
- It is used to evaluate performance of different metrics in an organisation.

Average contribution

465.553 264.952.406

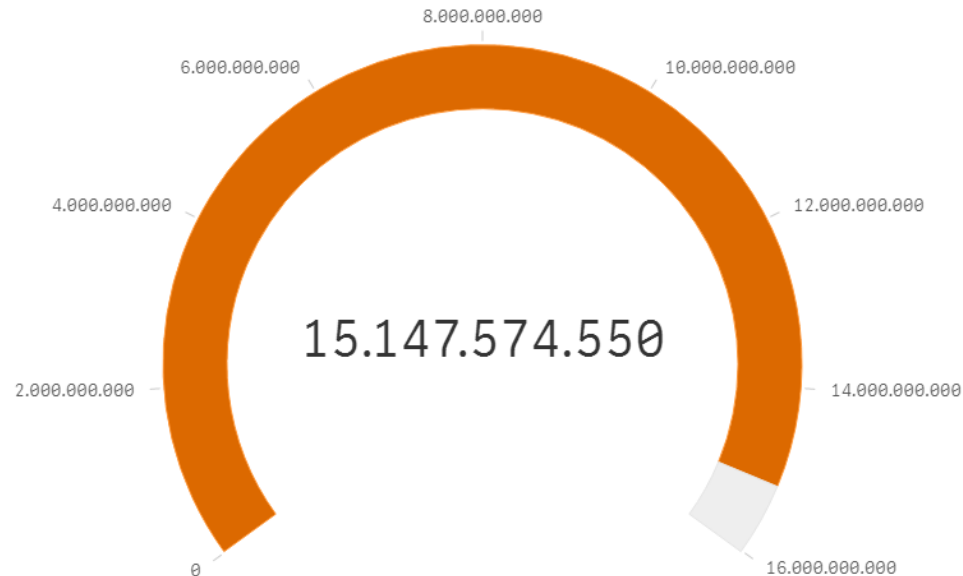
Maximum contribution

Qlik Sense[®] basics

Visualisations

Gauge

- It is used to indicate the completion of a goal.
- The gauge is often used to present KPIs, for example, on an executive dashboard, and together with segmenting and colour coding, it is an effective way of illustrating a performance result.

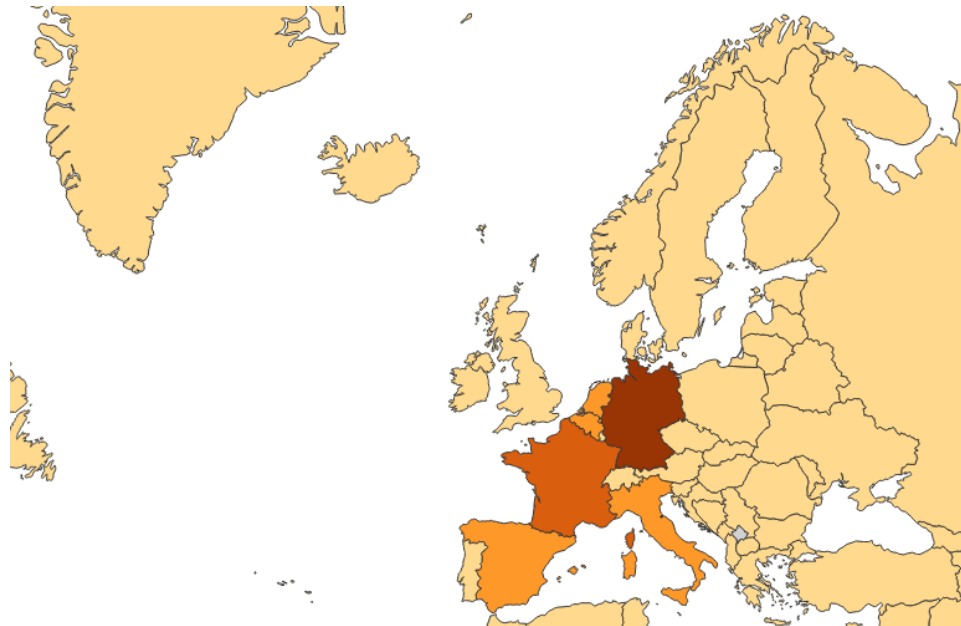


Qlik Sense[®] *basics*

Visualisations

Map

- It is used to display data as point and or areas on a map.
- It is used to display the geographical distribution of variables, such as sales by office, store, city or country around the world.



Qlik Sense[®] basics

Visualisations

Pivot table

- It is used to summarise and create a cross table view of data. It is particularly useful when you want to include several dimensions or measures in a single table, and then want to reorganize them to explore different subtotals.
- In a pivot table you can analyse data by multiple measures and in multiple dimensions at the same time. You can rearrange the measures and dimensions to get different views of the data.

Country ▼ Project ▼	EC Contribution (€)
+ Thailand	379.475,00€
+ Namibia	364.253,50€
+ New Zealand	358.355,00€
+ Nepal	349.378,75€
+ Armenia	317.160,00€
- Jordan	311.558,75€
CREATE	129.300,00€
VI-SEEM	78.758,75€
STOI_4EWAS	71.000,00€
MEDIA	22.500,00€

Qlik Sense[®] basics

Visualisations

Table

- It displays values in record form, so that each row of the table displays the fields aligned as in the data source. Fields containing calculated values can also be added.
- Use them when you want to view detailed data and precise values rather than visualizations of values.

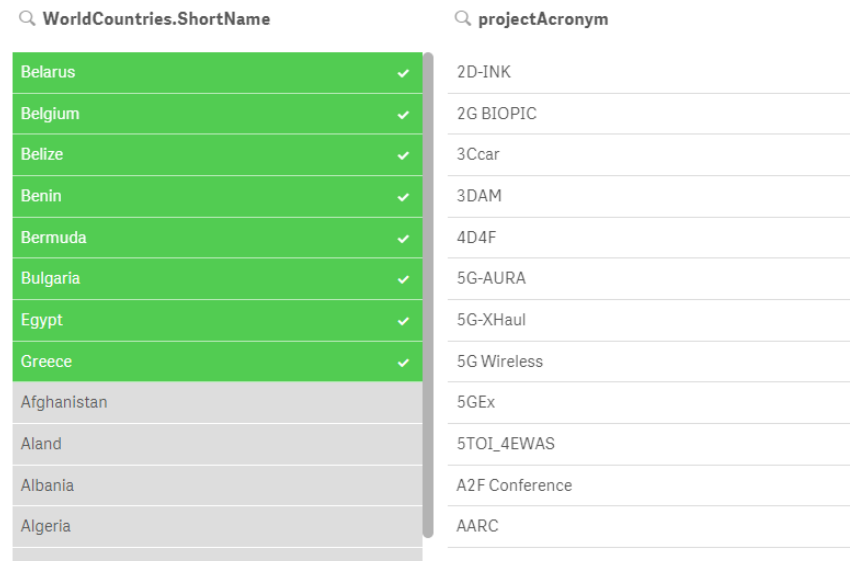
Country	Number of projects	Average contribution	Count(ecContribution)	Total amount of contributions
BE	1580	461.140	1580	728.601.763
DE	4750	579.338	4750	2.751.853.443
ES	3785	357.584	3785	1.353.456.643
FR	3250	487.130	3250	1.583.171.391
IT	3442	361.475	3441	1.243.837.042
NL	2339	520.845	2339	1.218.256.579
UK	4793	492.295	4793	2.359.569.619
Others	12612	339.394	12612	4.280.433.949

Qlik Sense® basics

Visualisations

Filter pane

- Essentially an index to make selections to reduce the dataset by controlling what data is reflected in the visualizations on a sheet.
- Multiple filter panes can be combined, to easily make several selections and define your data set exactly like you want it.

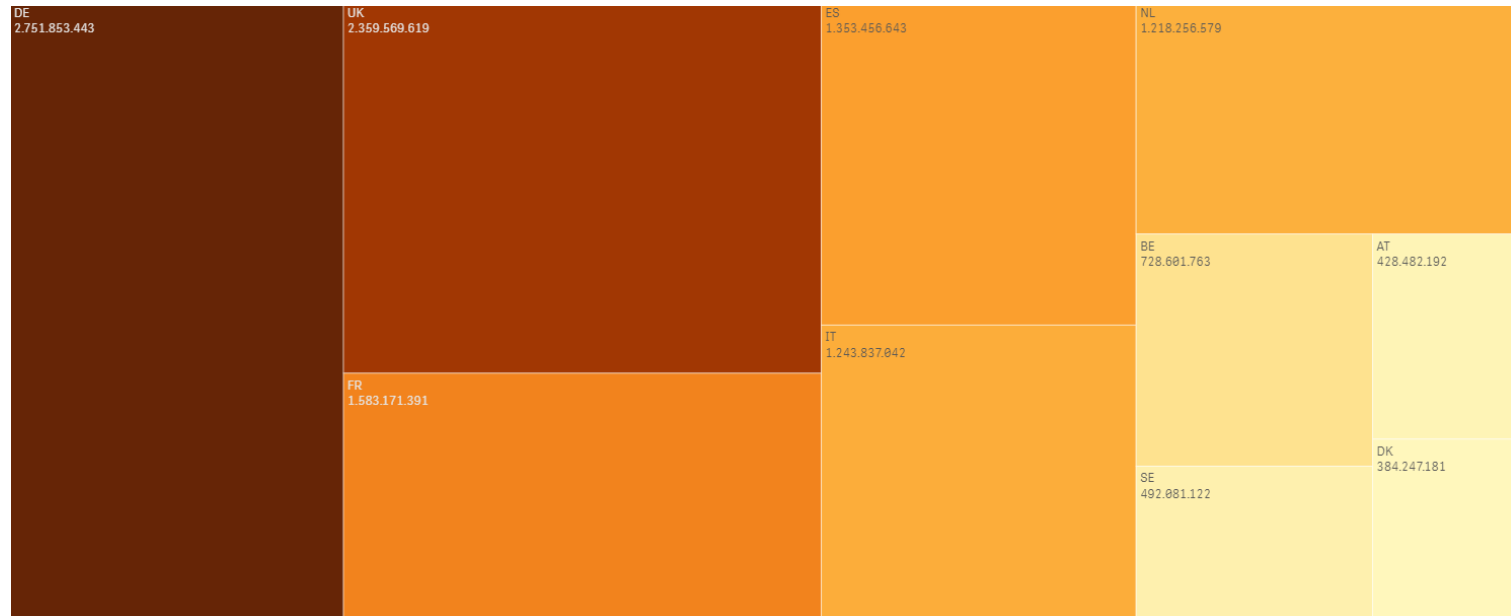


Qlik Sense[®] basics

Visualisations

Treemap

- It is used to display a large amount of hierarchical data within a limited space.
- It is great at displaying aggregate data and allowing exploration through drilling down.



Qlik Sense[®] basics

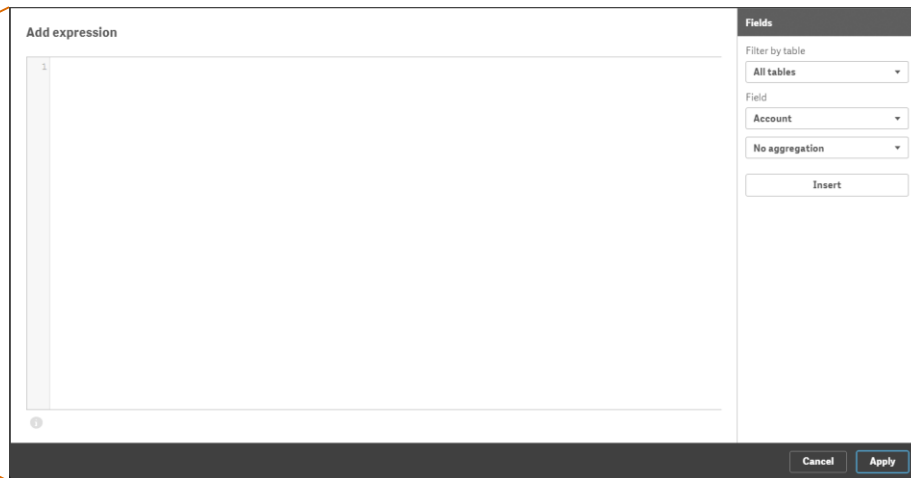
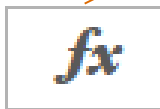
Functions

- Functions are used to manipulate data in apps. There are several hundreds available functions in Qlik Sense[®] that can be used for various purposes, such as to perform calculations, interpret data, determine conditions etc.
- Functions always take their parameter(s) enclosed in parentheses ().
- An overview can be found:
<https://help.qlik.com/en-US/sense/3.1/Subsystems/Hub/Content/Scripting/functions-in-scripts-chart-expressions.htm>
- Some examples of functions:
 - IF ()
 - COUNT ()
 - AGGR ()
 - DATE ()
 - SUM ()
 - AVG ()
 - NUM ()
 - RANK ()
 - RGB ()
 - CYAN ()

Qlik Sense[®] basics

Expressions

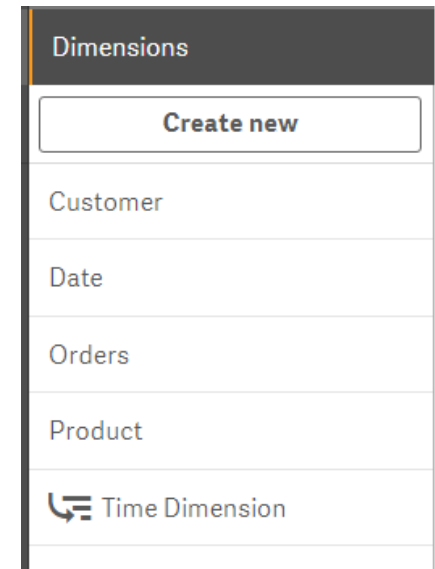
- Expressions are combinations of fields, variables, operators, functions and numbers put together in a structured way to calculate a value.
- Expressions are used in scripts and chart visualisations, to manipulate data and/or affect appearance.
- The presence of the following icon indicates the possibility to use an expression. It opens the **Expression Editor**, a handy tool that assists in the creation and debugging of expressions.



Qlik Sense® basics

Dimensions

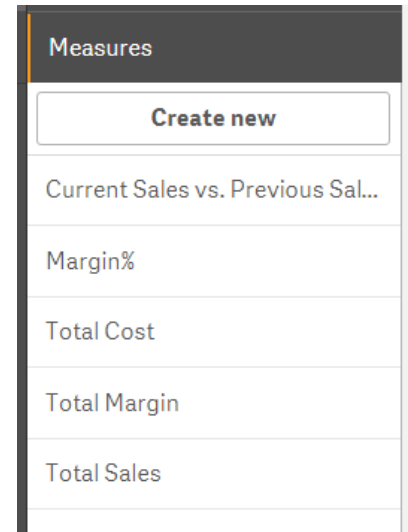
- Dimensions determine **how the data in a visualisation is grouped**. In essence they offer the lens through which we break down and explore our data.
- *For example* the dimension will be represented by slices in a pie chart or bars in a bar chart to view the contribution of funds by country or by project.
- In Qlik Sense® dimensions are created automatically from the fields in the source data. Additionally custom dimensions can be created.
- Dimensions can be **single** or **drill-down**



Qlik Sense[®] basics

Measures

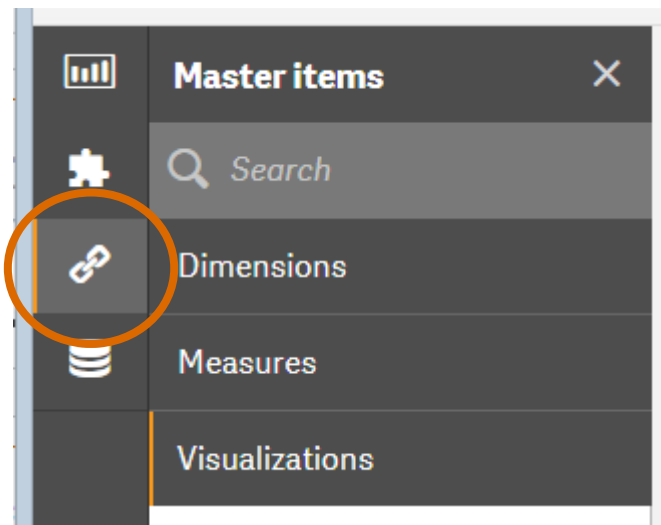
- Measures are calculations used in visualizations, typically represented on the y-axis of a bar chart or a column in a table. Measures are created with expressions composed of aggregation functions, such as:
 - **Sum:** Calculates the sum of the field's values for each value of the dimension;
 - **Avg:** Calculates the average of the field's values for each value of the dimension;
 - **Count:** Calculates the number of values in the field for each value of the dimension;
 - **Min:** Calculates the minimum value of the field for each value of the dimension;
 - **Max:** Calculates the maximum value of the field for each value of the dimension.
- Additionally custom measures can also be created and are a major part of any Qlik project.



Qlik Sense[®] basics

Master Items

- Master items are customised and reusable assets such as visualizations, dimensions and measures that you can use throughout your app.
- You can use a master dimension in as many of your visualizations as you like and maintain it in just one place. Any updates you make to the master item will be applied everywhere the master item is used.



Qlik Sense[®] basics

Seeking help

- **Qlik Sense[®] online help pages**

Always remember there are online help pages that describe most of the features available.

<https://help.qlik.com/en-US/sense/3.1/Content/Home.htm>

- **Qlik Sense[®] Community**

Also if something is not documented in the formal documentation it will most probably exist in the forums. This is where you will refer to most often when.

<https://community.qlik.com/community/qlik-sense>

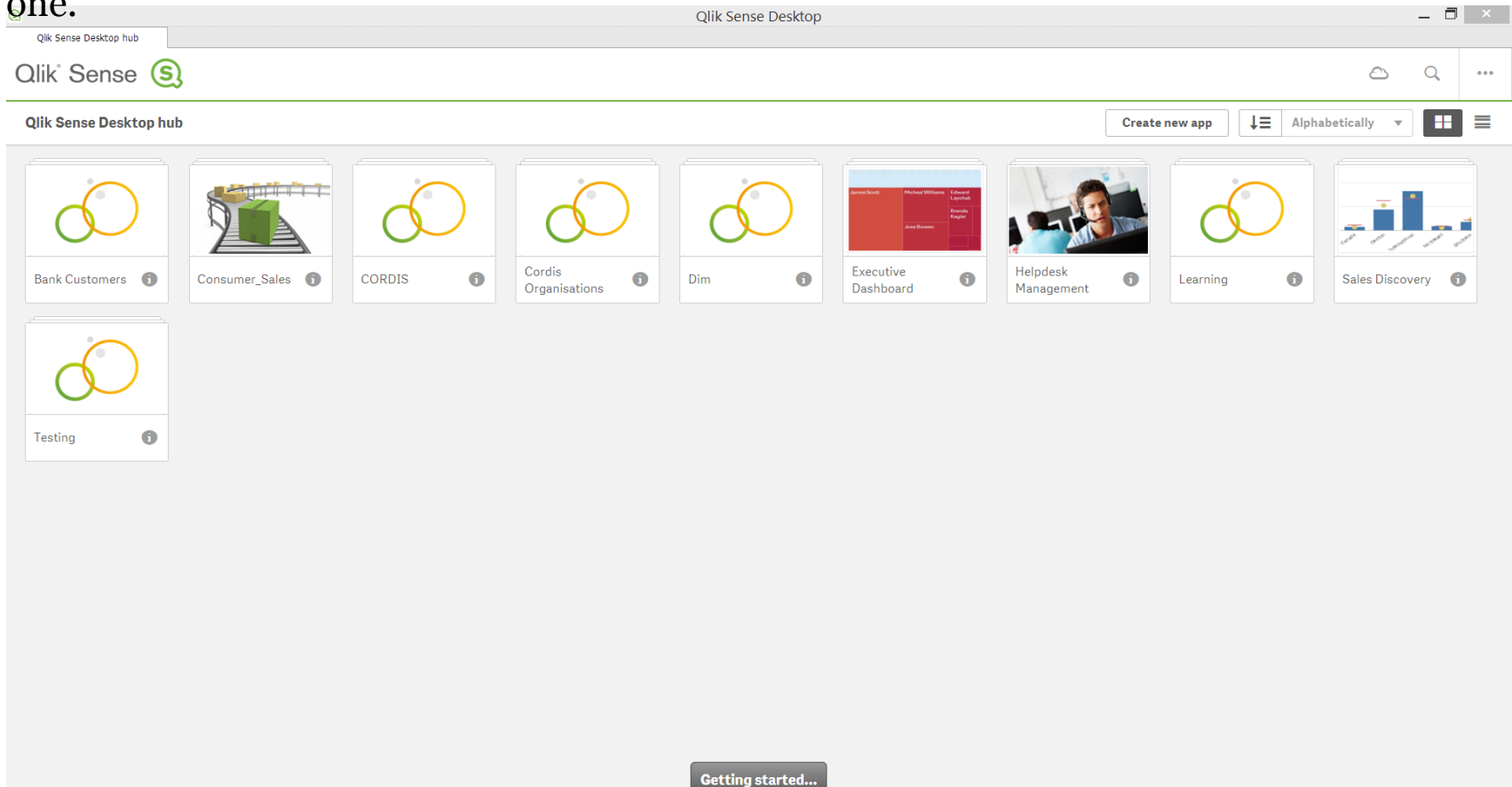
- **Tip!** When searching google, check out results for Qlik View. Often the answer will also be applicable in Qlik Sense[®].

Qlik Sense[®] user interface

Qlik Sense[®] user interface

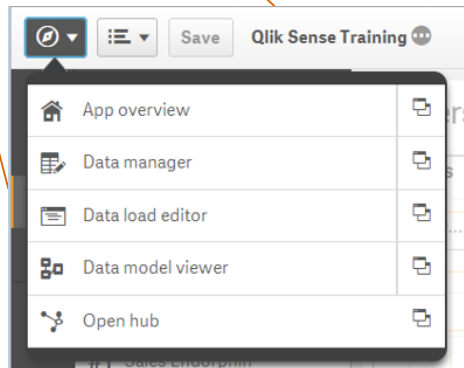
Qlik Sense[®] Hub

The Qlik Sense[®] Hub offers an overview of all your apps and is where you create a new one.



Qlik Sense[®] user interface

App overview



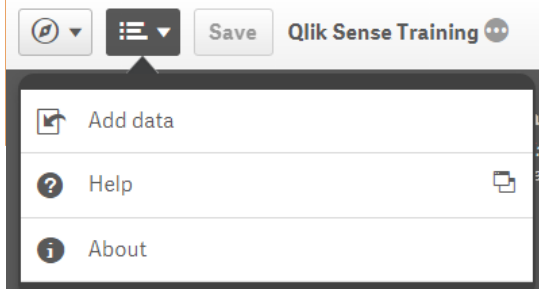
Navigation button, used to navigate between the main interfaces of app creation

1. The **App overview** is where you can see all the components of your app.
2. The **Data manager** allows you add data to and manage data in Qlik Sense[®].
3. The **Data load editor** allows more technical users to add data to their app and determine details through a scripting language.
4. The **Data model viewer** allows the user to visualise the data sources in his app and the connections between them.
5. Brings the user back to the **Qlik Sense[®] hub** where all the apps are hosted.

Qlik Sense[®] user interface

App overview

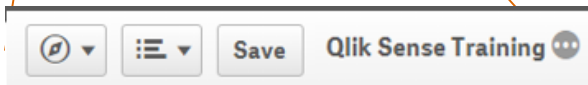
1 2 3 4



Dropdown menu with three choices: Add data, Help and About.

Qlik Sense[®] user interface

App overview



Save button, also remember to just Ctrl + S from time to time.

Qlik Sense[®] user interface

App overview



The three dots toggle the grey area, either collapsing or expanding it.
“Show app information”

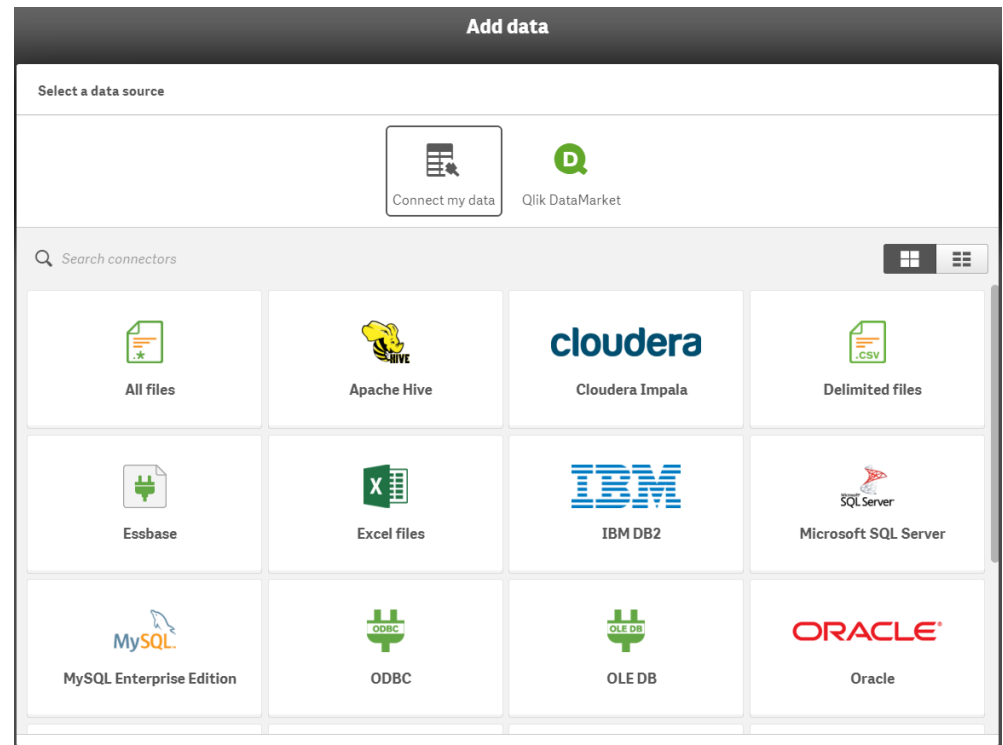
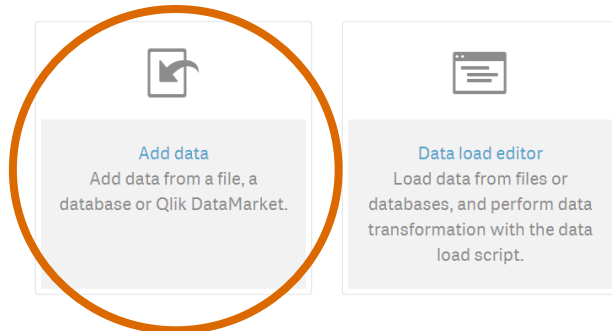
Qlik Sense® user interface

Data addition menu

There are a variety of different options to import data into Qlik Sense®. It is possible to import data locally or from web services.

- Text files (CSV or TSV files).
- HTML tables.
- Excel files
- XML files.
- Qlik native QVD and QVX files.

Get started adding data to your app.



Qlik Sense[®] user interface

Data addition menu

Data can also be uploaded using the data load editor, writing scripts.

The screenshot displays the Qlik Sense user interface. At the top, there is a navigation bar with a 'Save' button and a 'Load data' button. Below this is a search bar and a 'Data connections' panel on the right. The main area is divided into three sections: a left sidebar with a 'Main' menu, a central script editor, and a right sidebar with a 'Data connections' panel. The script editor contains the following code:

```
1 SET ThousandSep='.';
2 SET DecimalSep=',';
3 SET MoneyThousandSep='.';
4 SET MoneyDecimalSep='.';
5 SET MoneyFormat='#,##0,00£;-#,##0,00€';
6 SET TimeFormat='hh:mm:ss';
7 SET DateFormat='DD/MM/YYYY';
8 SET TimestampFormat='DD/MM/YYYY hh:mm:ss[.fff]';
9 SET FirstWeekDay=0;
10 SET BrokenWeeks=0;
11 SET ReferenceDay=4;
12 SET FirstMonthOfYear=1;
13 SET CollationLocale='en-GB';
14 SET CreateSearchIndexOnReload=1;
15 SET MonthNames='Jan;Feb;Mar;Apr;May;Jun;Jul;Aug;Sep;Oct;Nov;Dec';
16 SET LongMonthNames='January;February;March;April;May;June;July;August;S';
17 SET DayNames='Mon;Tue;Wed;Thu;Fri;Sat;Sun';
18 SET LongDayNames='Monday;Tuesday;Wednesday;Thursday;Friday;Saturday;Sun';
```

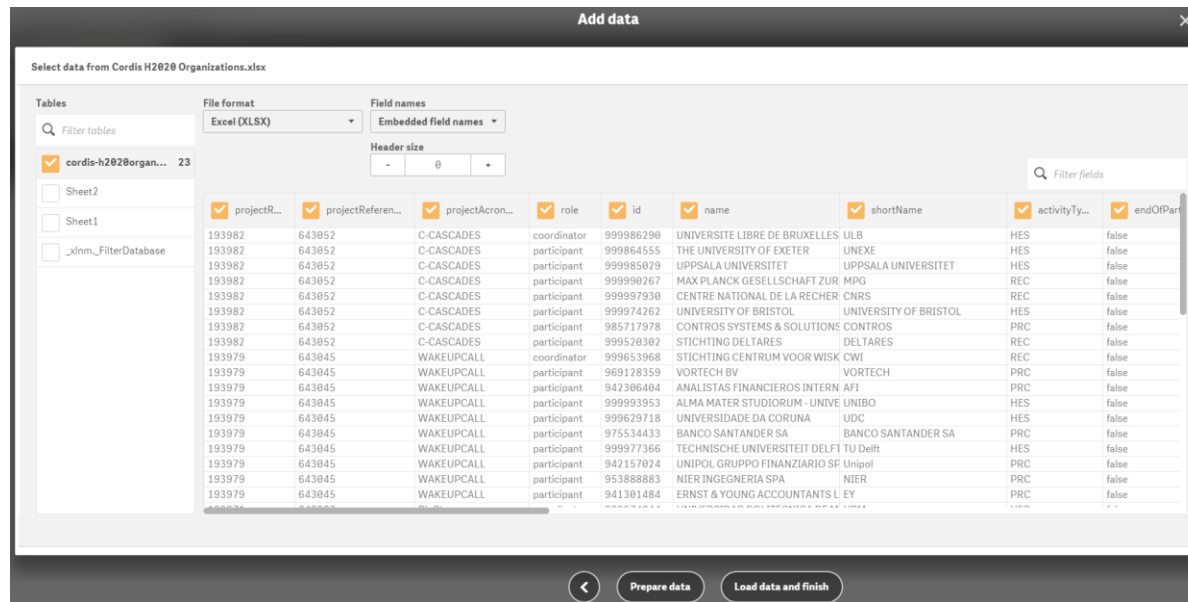
Below the screenshot, there are two cards. The first card, 'Add data', is circled in orange and contains the text: 'Add data from a file, a database or Qlik DataMarket.' The second card, 'Data load editor', contains the text: 'Load data from files or databases, and perform data transformation with the data load script.'

Qlik Sense[®] user interface

Data preparation menu

From this menu we prepare the data we import to our app.

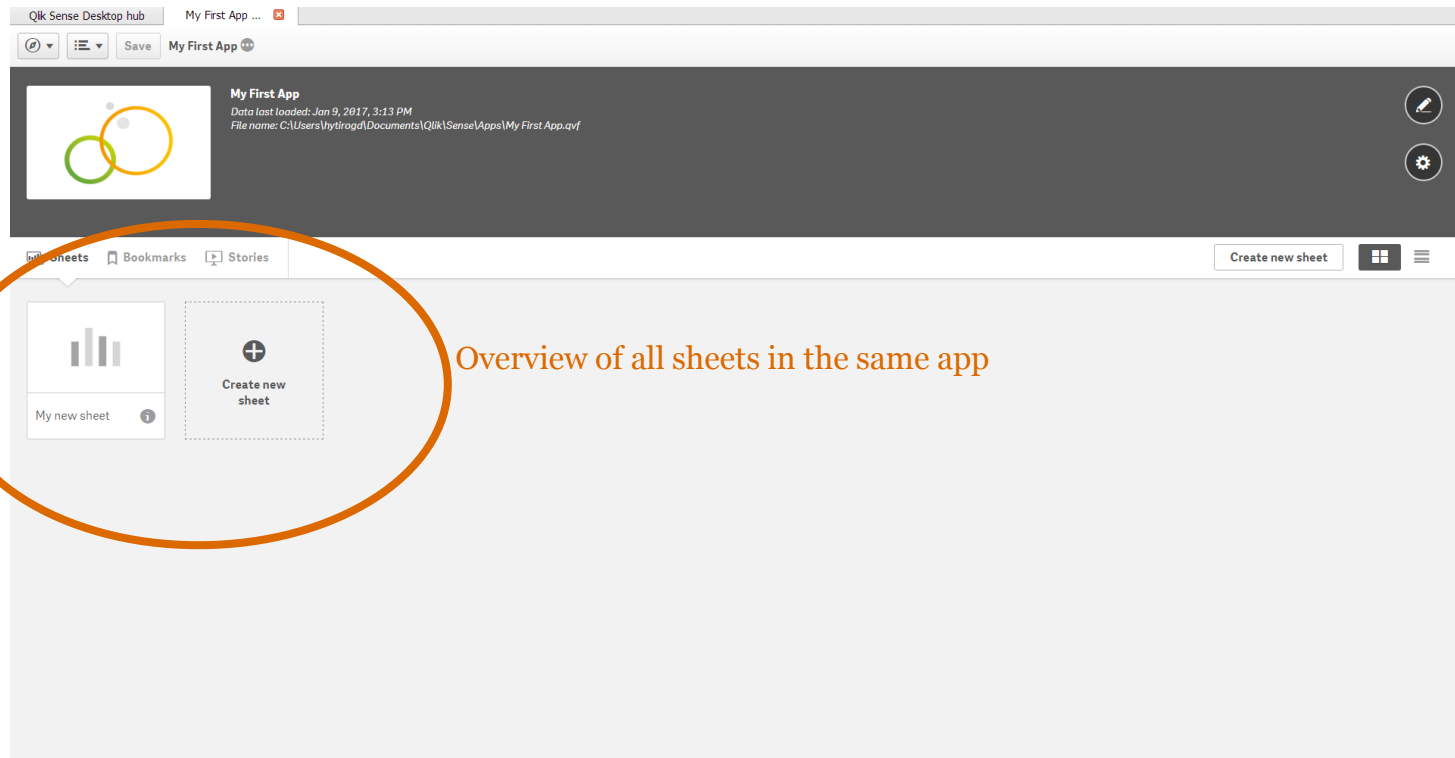
- We can select the columns we need and remove the rest for faster data loading and interaction times;
- We can rename the columns to more readable or useful labels;
- Finally we can determine the types of the fields imported for optimal analysis.



Qlik Sense[®] user interface

App overview

In the app overview, we can view and edit the contents of our app. These include the sheets, the bookmarks and the stories.



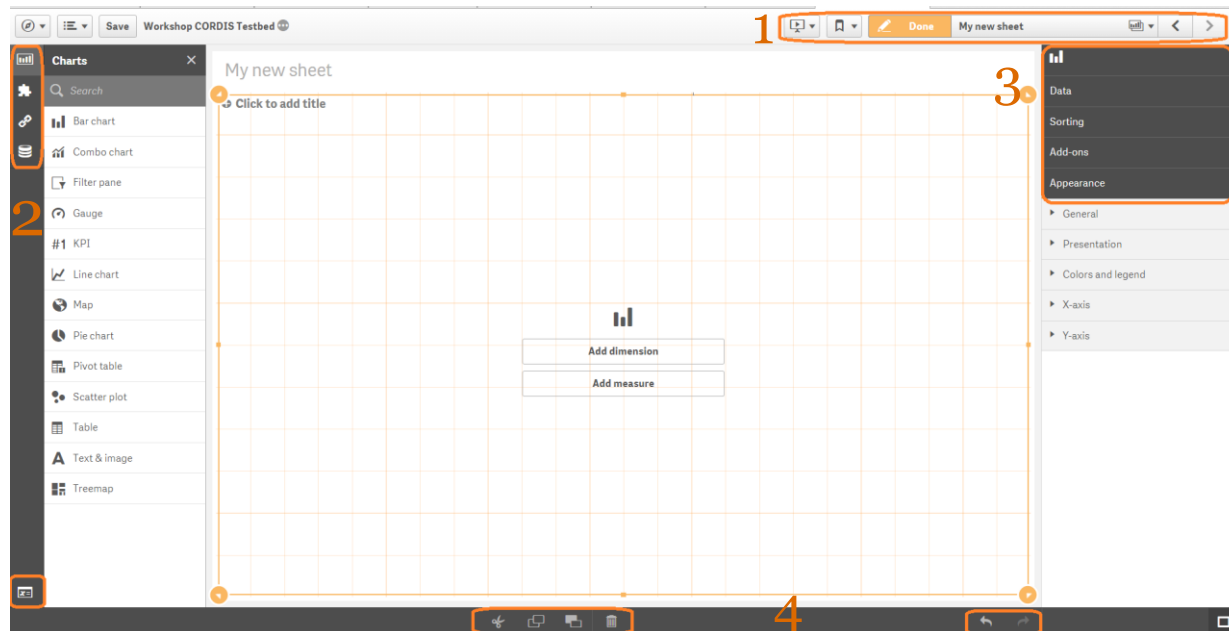
Overview of all sheets in the same app

Qlik Sense[®] user interface

Sheet edit interface

This is where the main work is carried out, that is creating your app's sheets.

1. Here you access your Stories, Bookmarks and Sheets, and switch between sheet views;
2. Here you find your Charts, Custom Items, Master items, fields and variables;
3. From here you find and edit the properties of the currently selected chart.
4. Cut, copy, duplicate delete, undo and redo.



Hands on exercise

Visualising CORDIS Data



Hands on exercise

Visualising CORDIS Data

Context

- For our first hands on exercise we will create a dashboard using data from the European Commission's Community Research and Development Information Service (CORDIS).
- CORDIS is a portal for information on EU-funded research projects.
- For our exercise we will be exploring a dataset containing information on **research contributions by the EU to different countries, for different projects under the HORIZON 2020 (H2020) framework programme for research and innovation from 2014 to 2020.**

Instructions

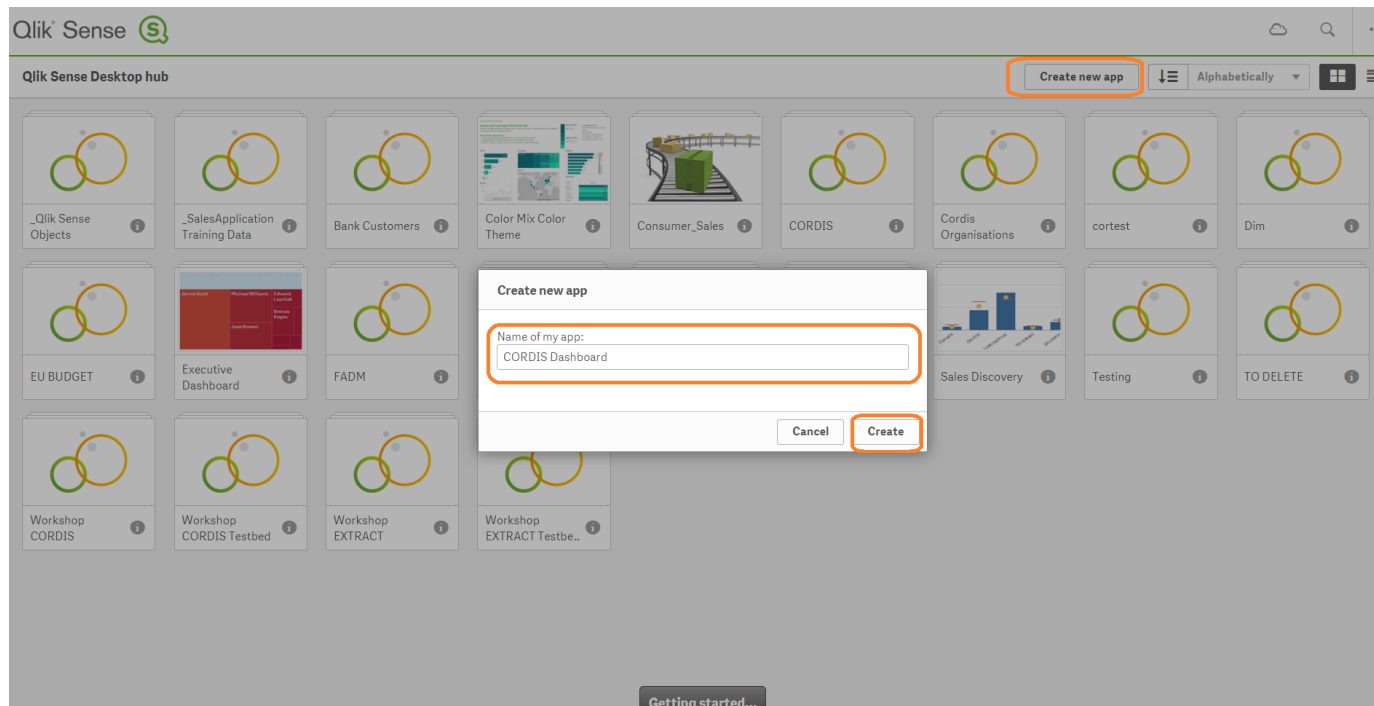
- During the next slides any text written in **black** indicates explanations.
- Any text written in **red** indicates actions you need to take for the exercise.

Hands on exercise

Visualising CORDIS Data

Preparing our data

In the Qlik Sense[®] Hub click on “Create new app” give it a name and click “Create”



Hands on exercise

Visualising CORDIS Data

Adding our data

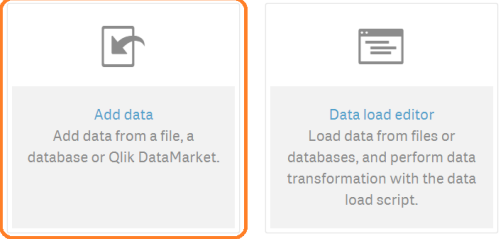
Upon opening your empty app you are prompted to add data to it.

Select “Add data”

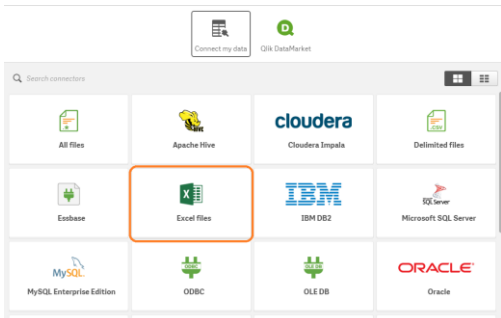
From the next menu choose “Excel files”

Navigate to the CORDIS H2020 Organisations.xlsx file and select it.

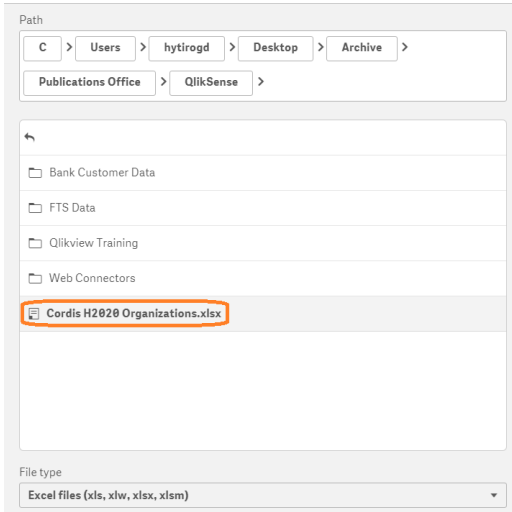
1 Get started adding data to your app.



2 Select a data source



3 Select file



The image shows three sequential screenshots of the Qlik Sense interface. The first screenshot shows the 'Add data' and 'Data load editor' options, with 'Add data' highlighted. The second screenshot shows the 'Select a data source' dialog with 'Excel files' highlighted. The third screenshot shows the 'Select file' dialog with the file 'Cordis H2020 Organizations.xlsx' highlighted.

Hands on exercise

Visualising CORDIS Data

Preparing our data

De-select all the columns after “city” and click “Load data and finish”

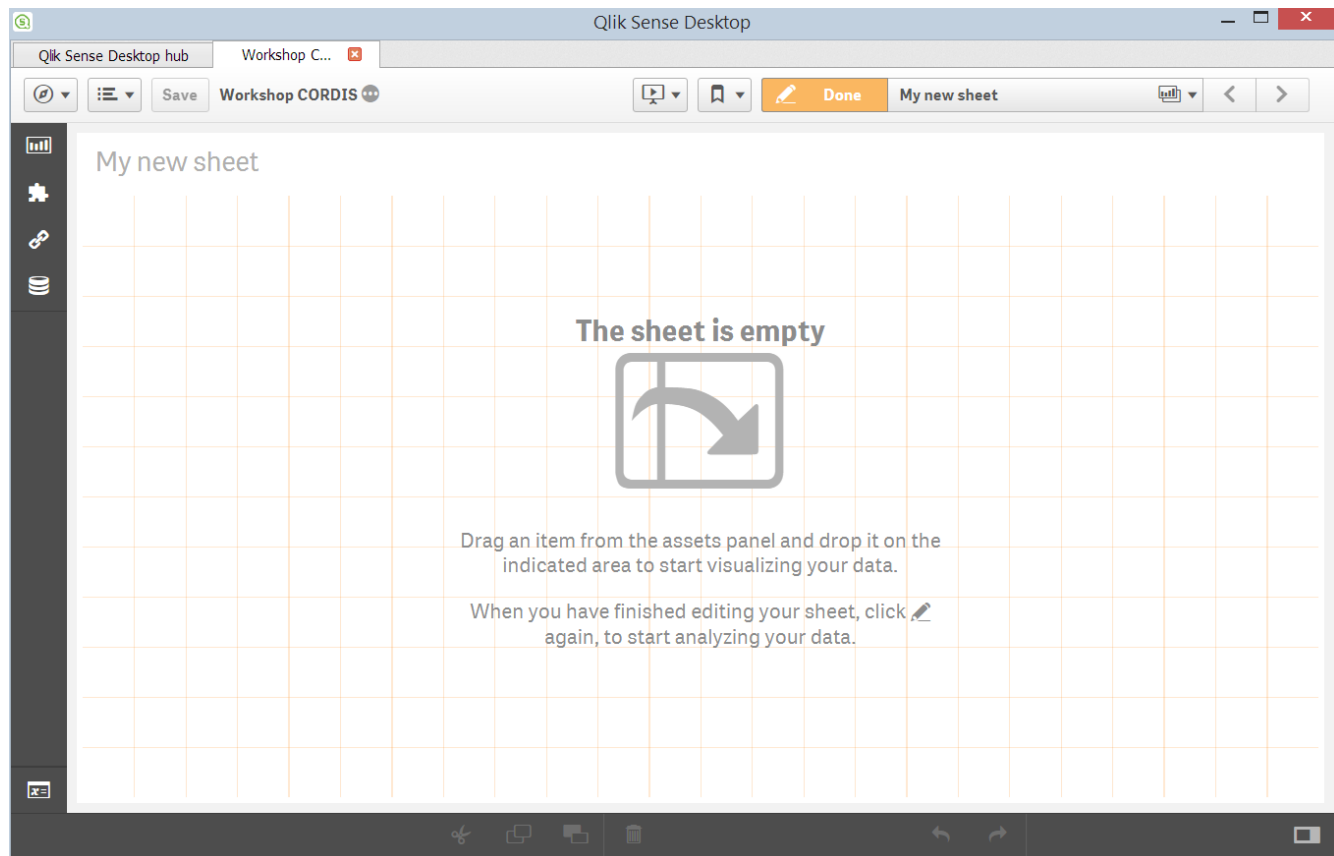
The screenshot shows the 'Add data' dialog in Qlik Sense. The dialog is titled 'Add data' and has a close button (X) in the top right corner. Below the title bar, it says 'Select data from Cordis H2020 Organizations.xlsx'. The dialog is divided into several sections:

- Tables:** A search box labeled 'Filter tables' and a list of tables: 'cordis-h2020organ... 11', 'Sheet2', 'Sheet1', and '_xlnm_FilterDatabase'.
- File format:** A dropdown menu set to 'Excel (XLSX)'.
- Field names:** A dropdown menu set to 'Embedded field names'.
- Header size:** A control with a minus sign, '0', and a plus sign.
- Field selection:** A list of fields with checkboxes. The fields are: 'ecContributi...', 'coun...', 'street', 'city', 'postCo...', 'organizationUrl', 'contactTy...', and 'contactTI...'. The checkboxes for 'ecContributi...', 'coun...', 'street', and 'city' are checked. The checkboxes for 'postCo...', 'organizationUrl', 'contactTy...', and 'contactTI...' are unchecked. A red box highlights the unchecked checkboxes for 'postCo...', 'organizationUrl', 'contactTy...', and 'contactTI...'.
- Table preview:** A table showing the first few rows of data. The columns correspond to the selected fields: 'ecContributi...', 'coun...', 'street', 'city', 'postCo...', 'organizationUrl', 'contactTy...', and 'contactTI...'. The first row of data is: 250560, BE, Avenue Franklin Roosevelt 50, BRUXELLES, 4050, www.frb.be, , .
- Buttons:** At the bottom, there are three buttons: a back arrow, 'Prepare data' (highlighted with a red box), and 'Load data and finish'.

Hands on exercise

Visualising CORDIS Data

Our First Sheet



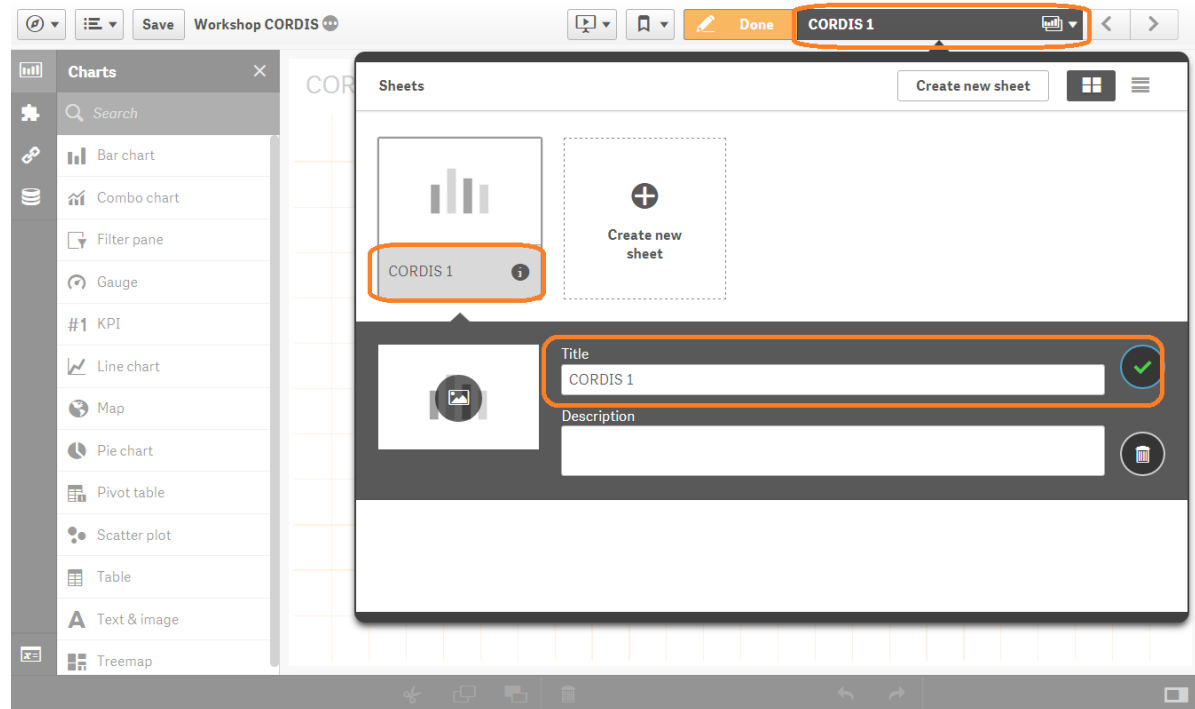
Hands on exercise

Visualising CORDIS Data

Our First Sheet

Click on the sheet name to rename it and to add a description.

For example “CORDIS 1”



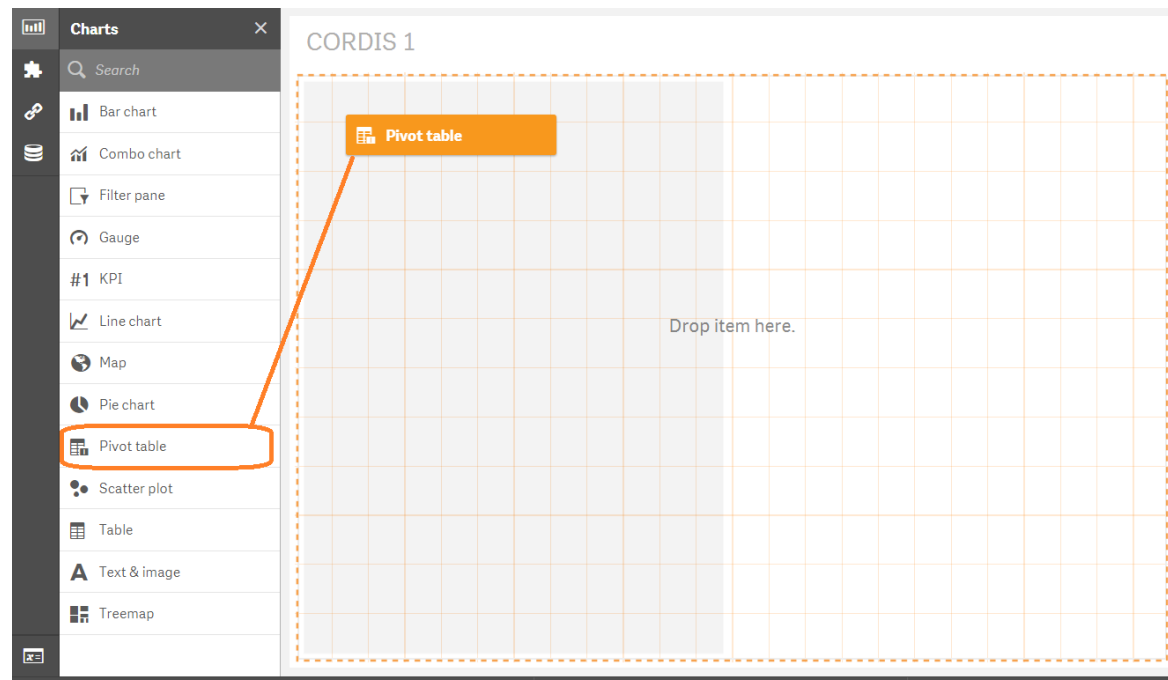
Hands on exercise

Visualising CORDIS Data

Adding a Pivot Table

Drag and drop a “Pivot table” chart from the left onto your sheet.

Notice that when doing so you can move it around to preview the position it will take on your sheet.



Hands on exercise

Visualising CORDIS Data

Adding a Pivot Table

Add the dimension “country”

Add the measure “Sum(ecContribution)”

The image displays two sequential screenshots of the Qlik Sense interface, illustrating the steps to create a pivot table visualization for CORDIS data.

Left Screenshot: The 'Charts' panel on the left shows various chart types. The 'Pivot table' option is selected. In the main workspace, a 'CORDIS 1' visualization is being created. A dimension list is open, and the 'country' field is highlighted with an orange box. Below the list, the 'Add dimension' button is also highlighted with an orange box.

Right Screenshot: The 'Charts' panel remains the same. In the main workspace, the 'country' dimension is now added to the visualization. A measure list is open, and the 'Sum(ecContribution)' measure is highlighted with an orange box. Below the list, the 'Add measure' button is also highlighted with an orange box.

Hands on exercise

Visualising CORDIS Data

Adding a Pivot Table

OK now let's add another dimension to our pivot table.

Drag "ProjectAcronym" on to your pivot table from the "Fields" menu.

The screenshot shows the Qlik Sense interface. On the left, the 'Fields' menu is open, displaying a list of fields: activityType, city, country, ecContribution, endOfParticipation, id, name, projectAcronym, role, shortName, and street. The 'projectAcronym' field is highlighted with an orange box. On the right, a pivot table titled 'CORDIS 1' is displayed. The table has 'country' as a dimension and 'Sum(ecContribution)' as a measure. The data rows are: AI (533700), AL (556508,75), AM (317160), AR (2000000), AT (2000000), AU (2000000), AZ (2000000), BA (2000000), BD (449077), BE (728601763,36), BF (260978,5), BG (22497983,5), BI (40031,25), and BR (2377541,38). A context menu is open over the table, with 'Add projectAcronym' highlighted. An orange arrow points from the 'projectAcronym' field in the Fields menu to the 'Add projectAcronym' option in the context menu.

country	Sum(ecContribution)
AI	533700
AL	556508,75
AM	317160
AR	2000000
AT	2000000
AU	2000000
AZ	2000000
BA	2000000
BD	449077
BE	728601763,36
BF	260978,5
BG	22497983,5
BI	40031,25
BR	2377541,38

Hands on exercise

Visualising CORDIS Data

Adding a Pivot Table

Now let's Fix the appearance of our pivot table.

Using the anchors to make the pivot table the narrowest possible while still displaying both columns.

Then click on the Done button to view your sheet as it will be displayed when in use.

Notice the difference of appearance between the “edit” menu and the actual “preview”

country	Sum(ecContribution)
AI	533700
AL	556508,75
AM	317160
AR	1532634,73
AT	428482192,2
AU	3347607,75
AZ	158731,25
BA	1541029,75
BD	449077
BE	728601763,36
BF	260978,5
BG	22497983,5
BI	40031,25
BR	2377541,38
BW	149580,75

The screenshot shows the Qlik Sense interface for editing a pivot table. The table is titled 'CORDIS 1' and is displayed in a preview mode. The table has two columns: 'country' and 'Sum(ecContribution)'. The data is the same as in the table above. The table is surrounded by orange anchors, indicating that it is being edited. The 'Done' button is visible at the top of the editor.

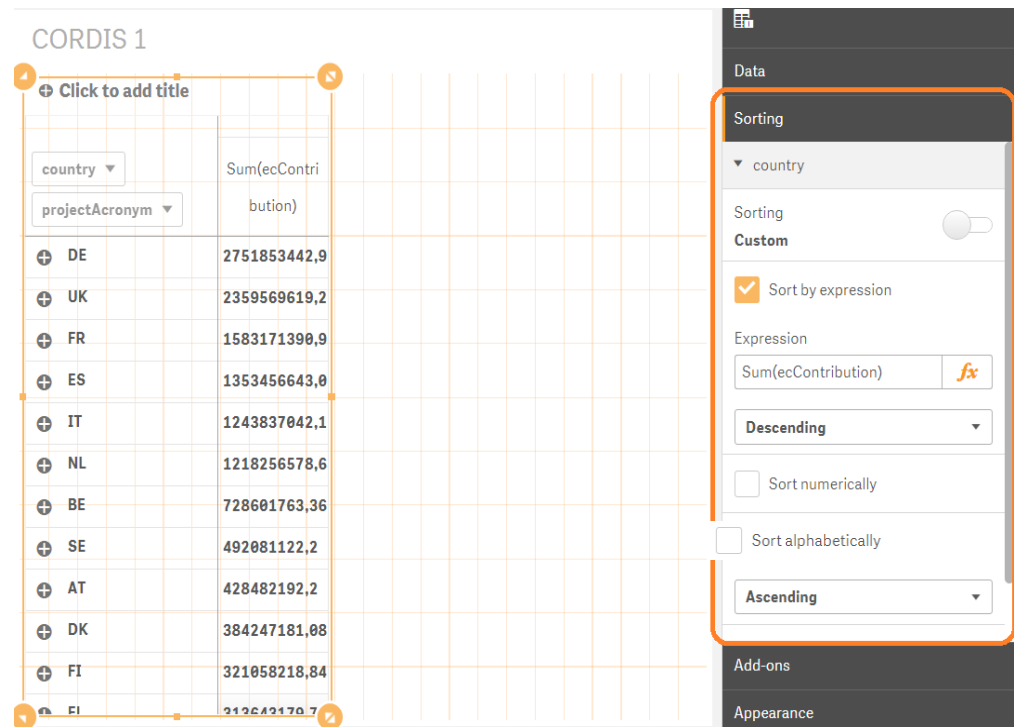
Hands on exercise

Visualising CORDIS Data

Adding a Pivot Table

Our pivot table is by default sorted alphabetically, which is not the best option for our case. Let's sort it by the SUM of the contribution received:

- From the “Sorting” menu de-select “Auto” sorting.
- Select “Sort by expression”
- Input “Sum(ecContribution)”
- Select “Descending”
- De-select “Alphabetically”
- Do the same for projectAcronym



CORDIS 1

country	Sum(ecContribution)
DE	2751853442,9
UK	2359569619,2
FR	1583171390,9
ES	1353456643,0
IT	1243837042,1
NL	1218256578,6
BE	728601763,36
SE	492081122,2
AT	428482192,2
DK	384247181,08
FI	321058218,84
EL	212642170,7

Sorting panel configuration:

- Sorting: Custom
- Sort by expression:
- Expression: Sum(ecContribution) *fx*
- Sort order: Descending
- Sort numerically:
- Sort alphabetically:

Hands on exercise

Visualising CORDIS Data

Adding a Pivot Table

Another noticeable issue is that the appearance of the values in our table our not consistent.

In the “Data” menu, under measures, Sum(ecContibution) change the number formatting to “Money” and format the pattern to display the values in euros by replacing the “£” symbols.

The key for the “€” symbol should be “Right Alt + E”

The screenshot shows a Qlik Sense pivot table titled "CORDIS 1". The table has columns for "country" and "projectAcronym", and a measure column for "Sum(ecContribution)". The values are displayed in a currency format with two decimal places and a Euro symbol (€). The configuration panel on the right shows the "Data" menu, the "Measures" section, and the "Number formatting" dropdown set to "Money". The "Format pattern" is set to "#.##0,00€;-#.##0,00€".

country	projectAcronym	Sum(ecContribution)
DE		2.751.853.442,92€
UK		2.359.569.619,29€
FR		1.583.171.390,95€
ES		1.353.456.643,02€
IT		1.243.837.042,17€
NL		1.218.256.578,68€
BE		728.601.763,36€
SE		492.081.122,20€
AT		428.482.192,20€
DK		384.247.181,08€
FI		321.058.218,84€
EL		313.643.179,79€

Hands on exercise

Visualising CORDIS Data

Adding a Pivot Table

If you click on “Done” to view the pivot table and scroll through, you will notice that it also lists a number of countries that have received no contributions. We do not need those in our table.

In the “Data” menu, under rows, under country:

Add a Limitation of “Exact value” for values greater than “0”

Also de-select the “Show others” button

Repeat the same under Project.

The screenshot displays the Qlik Sense interface for a pivot table titled "CORDIS 1". The pivot table has "country" and "projectAcronym" as row dimensions and "Sum(ecContribution)" as the measure. The data is presented in a grid with columns for country, projectAcronym, and Sum(ecContribution). The "Data" menu is open, showing the "Rows" section with "country" selected. The "Limitation" dropdown is set to "Exact value", and the "Show others" checkbox is unchecked. The "Show null values" checkbox is checked. The "Calculated on measure" field is set to "Sum(ecContribution)".

country	projectAcronym	Sum(ecContribution)
DE		2.751.853.442,92€
UK		2.359.569.619,29€
FR		1.583.171.390,95€
ES		1.353.456.643,02€
IT		1.243.837.042,17€
NL		1.218.256.578,68€
BE		728.601.763,36€
SE		492.081.122,20€
AT		428.482.192,20€
DK		384.247.181,08€
FI		321.058.218,84€
EL		313.643.179,79€
IL		294.974.947,49€
IE		277.983.823,02€
NO		275.228.929,19€
PT		255.708.782,66€

Hands on exercise

Visualising CORDIS Data

Adding a Pivot Table

Finally let's fix the labels of our table. The row, column and measure labels are auto-generated from the field name. the rest are empty by default.

In the "Data" menu, go through the rows and the measure and make their labels more human friendly.

The screenshot displays the Qlik Sense interface. On the left, a pivot table titled "CORDIS 1" is shown with columns for "Country", "Project", and "EC Contribution (€)". The table contains data for various countries including DE, UK, FR, ES, IT, NL, BE, SE, AT, DK, FI, EL, IL, IE, and NO. On the right, the "Data" menu is open, showing the configuration for the pivot table. The "Rows" section lists "Country" and "Project". The "Columns" section is empty, showing "No data". The "Measures" section lists "EC Contribution (€)". The "Expression" field contains "Sum(ecContribution)" and the "Label" field contains "EC Contribution (€)".

Country	Project	EC Contribution (€)
DE		2.751.853.442,92€
UK		2.359.569.619,29€
FR		1.583.171.390,95€
ES		1.353.456.643,02€
IT		1.243.837.042,17€
NL		1.218.256.578,68€
BE		728.601.763,36€
SE		492.081.122,20€
AT		428.482.192,20€
DK		384.247.181,08€
FI		321.058.218,84€
EL		313.643.179,79€
IL		294.974.947,49€
IE		277.983.823,02€
NO		275.228.929,19€

Hands on exercise

Visualising CORDIS Data

Adding a Pivot Table

Finally let's fix the labels and titles of our table. The row, column and measure labels are auto-generated from the field name. The rest are empty by default.

In the "Appearance" menu, under "General", add a Title, Subtitle and Legend to better describe your pivot table.

The screenshot displays a pivot table titled "CORDIS 1" with the subtitle "EC Contributions by Country and Project". The table shows EC Contribution (€) for various countries. The configuration menu on the right is open to the "Appearance" section, where the "General" tab is selected. The "Show titles" option is turned on, and the Title, Subtitle, and Footnote fields are populated with text and currency symbols.

Country	Project	EC Contribution (€)
+	DE	2.751.853.442,92€
+	UK	2.359.569.619,29€
+	FR	1.583.171.390,95€
+	ES	1.353.456.643,02€
+	IT	1.243.837.042,17€
+	NL	1.218.256.578,68€
+	BE	728.601.763,36€
+	SE	492.081.122,20€
+	AT	428.482.192,20€
+	DK	384.247.181,08€
+	FI	321.058.218,84€
+	EL	313.643.179,79€
+	IL	294.974.947,49€
+	IE	277.082.022,02€

EC Contributions by Country and Project
The amounts displayed are taken from the EU ODP CORDIS dataset

Country Project EC Contribution (€)

DE 2.751.853.442,92€

UK 2.359.569.619,29€

FR 1.583.171.390,95€

ES 1.353.456.643,02€

IT 1.243.837.042,17€

NL 1.218.256.578,68€

BE 728.601.763,36€

SE 492.081.122,20€

AT 428.482.192,20€

DK 384.247.181,08€

FI 321.058.218,84€

EL 313.643.179,79€

IL 294.974.947,49€

IE 277.082.022,02€

*Countries that received no funds have been omitted from the table.

EC Contributions by Country an...

Data

Sorting

Add-ons

Appearance

General

Show titles

On

Title EC Contributions by Country ai fx

Subtitle The amounts displayed are tak fx

Footnote *Countries that received no fur fx

Show details

Hide

Show allows users to choose to view details such as descriptions, measures and dimensions.

Presentation

Hands on exercise

Visualising CORDIS Data

Adding a Bar Chart

OK! Next let's add a bar chart that will automatically adapt to our choices in the pivot table and help visualise the amounts to better convey their magnitude.

The screenshot shows the Qlik Sense interface with a pivot table titled "EC Contributions by Country and ...". The pivot table displays EC Contribution (€) for various countries. A bar chart is being added to the visualization area, indicated by an orange dashed box and an orange arrow pointing from the "Bar chart" option in the "Charts" panel to the chart icon in the visualization area.

Country	EC Contribution (€)
DE	2.751.853.442,92€
UK	2.359.569.619,29€
FR	1.583.171.390,95€
ES	1.353.456.643,02€
IT	1.243.837.842,17€
NL	1.218.256.578,68€
BE	728.601.763,36€
SE	492.081.122,20€
AT	428.482.192,20€
DK	384.247.181,08€
FI	321.058.218,84€
EL	313.643.179,79€
IL	294.974.947,49€

*Countries that received no funds have been omitted from the table

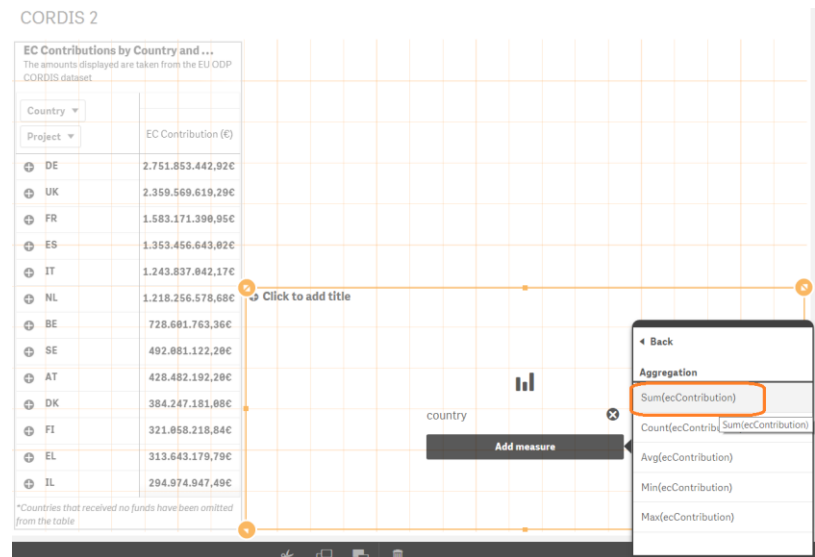
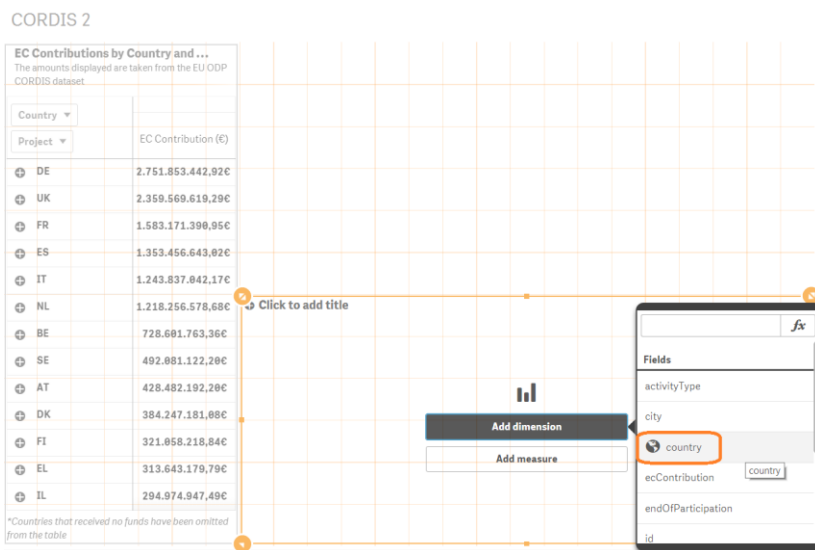
Hands on exercise

Visualising CORDIS Data

Adding a Bar Chart

Add “country” as a dimension

Add “Sum(ecContribution)” as a measure



Hands on exercise

Visualising CORDIS Data

Our first linked interactive visualisation

- *Click on “Done” to view your sheet in its proper form*
- *Notice how the charts have been automatically linked and both adapt based on selections on either one*

There are many ways in which you can explore your data and the more objects you add the more complex the options!

Hands on exercise

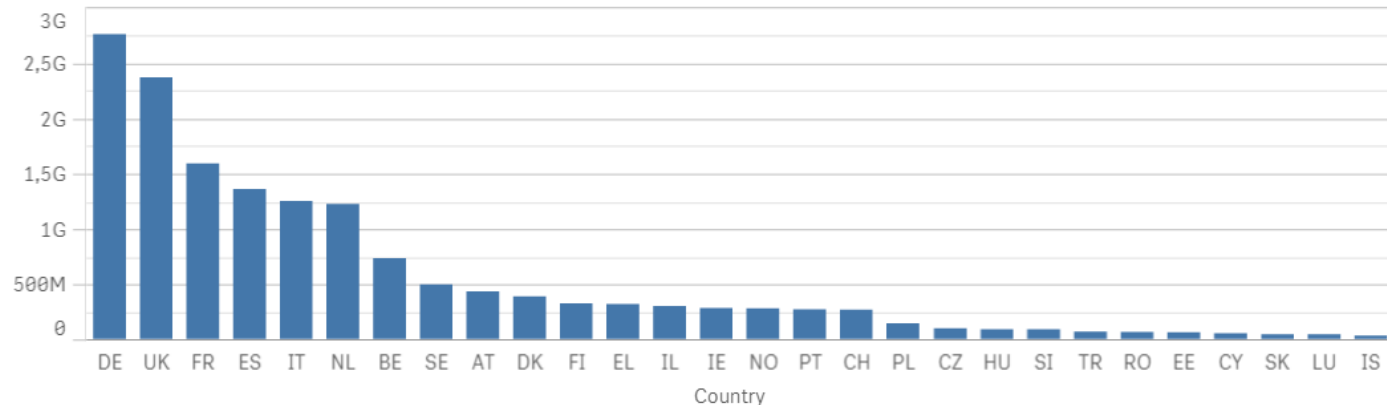
Visualising CORDIS Data

Adding a Bar Chart

Let's refine our bar chart and go on to the next part of our sheet.

- *Add a title*
- *Remove the Y Axis Title as its redundant*
- *Make the Y Axis scale narrower*

EC Contribution (€) by Country



Hands on exercise

Visualising CORDIS Data

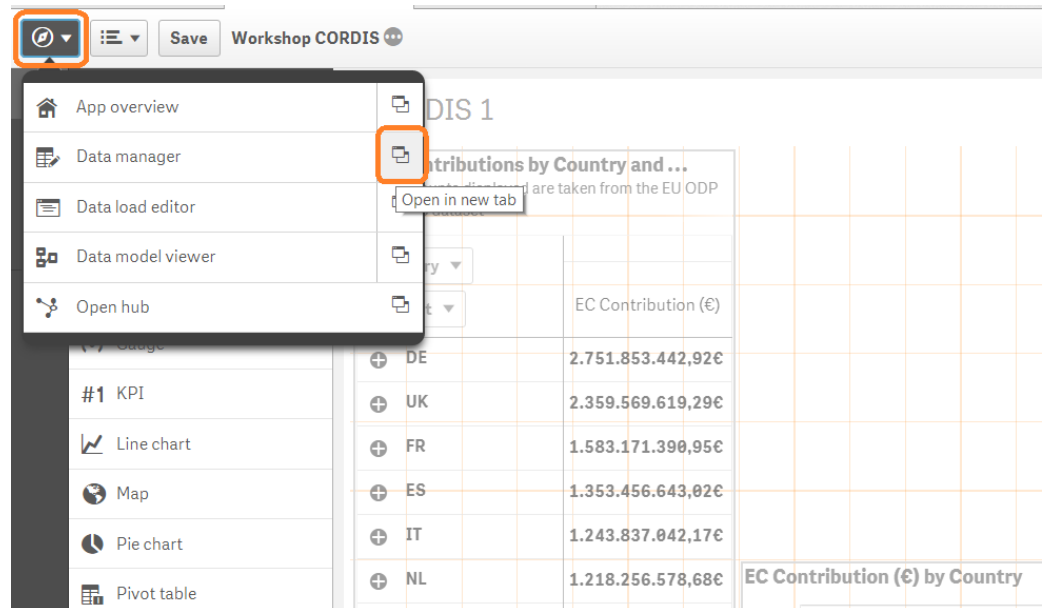
Adding a Map

It's time for everyone's favourite chart, the map!

Maps require special "Shape" data to define the locations. This data includes coordinates that outline areas and pinpoint locations.

We have provided you with just that.

Open your "Data manager" in a new tab.



The screenshot shows the Qlik Sense interface. The top navigation bar includes a home icon, a menu icon, a 'Save' button, and the text 'Workshop CORDIS'. A dropdown menu is open, listing several options: 'App overview', 'Data manager', 'Data load editor', 'Data model viewer', and 'Open hub'. The 'Data manager' option is highlighted with an orange box, and a tooltip 'Open in new tab' is visible next to it. Below the menu, a table titled 'Contributions by Country and ...' is visible, showing EC Contribution (€) for various countries. The table data is as follows:

Country	EC Contribution (€)
DE	2.751.853.442,92€
UK	2.359.569.619,29€
FR	1.583.171.390,95€
ES	1.353.456.643,02€
IT	1.243.837.042,17€
NL	1.218.256.578,68€

Hands on exercise

Visualising CORDIS Data

Adding a Map

In the Data manager click on the little cross on the right, to add a data source.

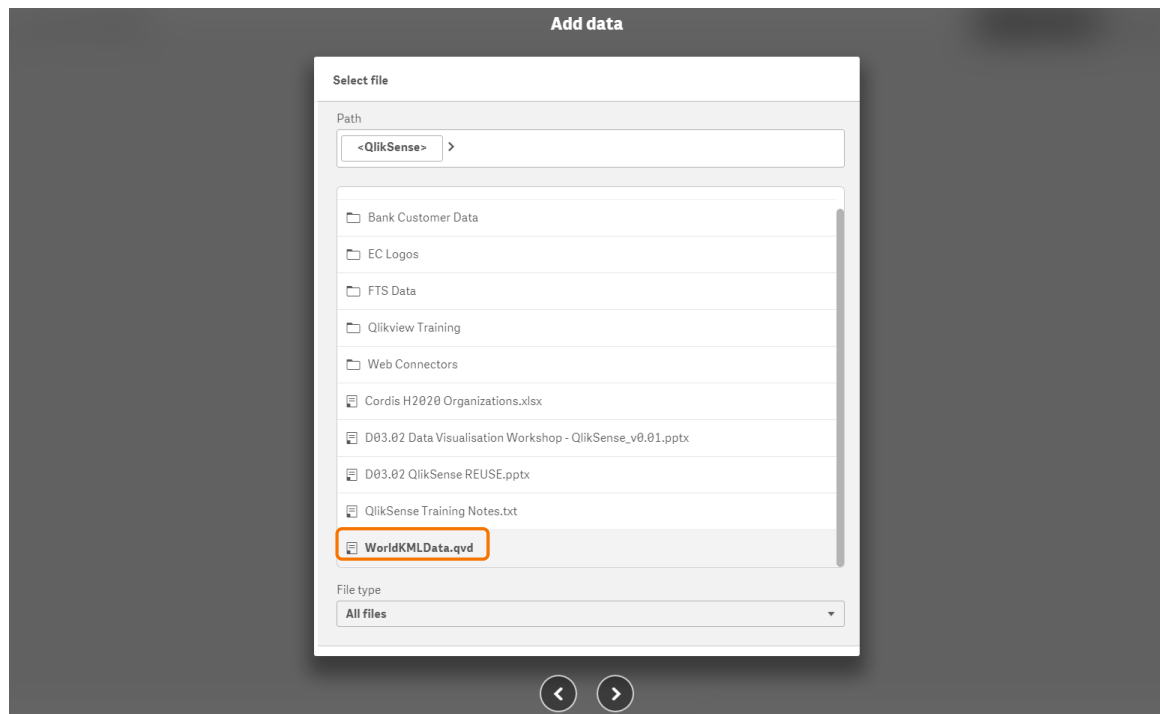


Hands on exercise

Visualising CORDIS Data

Adding a Map

Navigate to and select the “WorldKMLData.qvd” file. Click next.



Hands on exercise

Visualising CORDIS Data

Adding a Map

From the selection menu de-select the “WorldCountries.FullName” and “CountryISO_Numeric” as we won’t need them.

Then click “Load data and finish”.

The screenshot shows the 'Select data from WorldKMLData.qvd' interface in Qlik Sense. The 'File format' is set to 'QVD'. The 'Select all fields' checkbox is checked. A table of fields is displayed with checkboxes for selection. The 'WorldCountries.FullName' and 'CountryISO_Numeric' fields are highlighted with orange boxes, indicating they should be deselected. The table contains the following data:

Field	WorldCountries.ShortName	WorldCountries.Point	WorldCountries.Area	WorldCountries.FullName	CountryISO_2Char	CountryISO_3Char	CountryISO_Numeric
Aruba	Aruba	[69.98267466267889,12.52088880]	[69.89913876,12.45200511]	Aruba	AW	ABW	533
Afghanistan	Afghanistan	[66.00473114910083,33.83523216]	[74.89132572,37.23162954]	Afghanistan	AF	AFG	4
Angola	Angola	[17.564433459141835,-12.3319492]	[14.19084476,-5.87602345]	Angola	AO	AGO	24
Anguilla	Anguilla	[63.06498463657859,18.22396692]	[63.00121355,18.22178213]	Anguilla	AI	AIA	660
Albania	Albania	[20.049830336908954,41.1424512]	[20.06397464,42.54727407]	Albania	AL	ALB	8
Aland	Aland Islands	[19.943992364418964,60.2313432]	[20.61127974,60.04067658]	Aland Islands	AX	ALA	248
Andorra	Andorra	[1.560533681387033,42.54229174]	[1.70602542,42.50329743]	Andorra	AD	AND	20
United Arab Emirates	United Arab Emirates	[54.30548307948113,23.90239881]	[53.92779911,24.17720673]	United Arab Emirates	AE	ARE	784
Argentina	Argentina	[65.15610411121362,-35.1799642]	[64.54918100,-54.71619476]	Argentina	AR	ARG	32
Armenia	Armenia	[44.929142108429126,40.2890581]	[45.55239302,40.61607412]	Armenia	AM	ARM	51
American Samoa	American Samoa	[170.71801860340304,-14.304489]	[170.72629188,-14.35121673]	American Samoa	AS	ASM	16
Ashmore and Cartier Is.	Ashmore and Cartier Is.	[123.58383039520743,-12.4299425]	[123.5945028,-12.42570119]	Ashmore and Cartier Is.			
Antigua and Barb.	Antigua and Barbuda	[61.789969974695836,17.0777697]	[61.71607235,17.03699657]	Antigua and Barbuda	AG	ATG	28
Australia	Australia	[134.35514458942606,-25.5731800]	[158.87880904,-54.7097352]	Australia	AU	AUS	36
Austria	Austria	[14.126478086200365,47.5854984]	[16.9531051,48.59884268]	Austria	AT	AUT	40
Azerbaijan	Azerbaijan	[47.66493798620107,40.34400258]	[45.15283084,39.58267467]	Azerbaijan	AZ	AZE	31

Hands on exercise

Visualising CORDIS Data

Adding a Map

We are now in the **associations menu**. In this menu we can link different data sources based common data fields.

Each bubble represents a different data source.



Hands on exercise

Visualising CORDIS Data

Adding a Map

Drag and drop the “WorldKMLData” bubble onto the “CORDIS” bubble to create an association.

The screenshot shows the Qlik Sense interface with a workspace titled "Workshop CORDIS". In the center, two data bubbles are connected by an orange arrow. The bubble on the left is labeled "WorldKMLData" and the bubble on the right is labeled "cordis-h2020organizations-cop". Below the workspace, a data table is displayed with the following columns and rows:

WorldCountries.ShortName	WorldCountries.Point	WorldCountries.Area	CountryISO_2Char
Afghanistan	[66.00473114910083,33.83523216221645]	[[[[[74.89132572,37.23162954],[74.84021773,37.22506664],[74.76735396,37.24917369],[74.7389836,37.28563142],[74.7266846,37.29074738],[74.66896203,37.266692],	AF
Aland	[19.943992364418964,60.23134323252583]	[[[[[20.61127974,60.04067658],[20.60342492,60.0169571],[20.52177616,60.0116861],[20.48746301,60.03277009],[20.41118859,60.03013459],[20.39795943,60.04067658],	AX

Hands on exercise

Visualising CORDIS Data

Adding a Map

On doing so, notice that Qlik Sense automatically detects that there are common values between the country code fields of the two data sources.

The orange colour indicates a medium level of common values. This can also be green, for a very good match, or red, for no match at all.

The screenshot shows the Qlik Sense interface. At the top, a data model diagram displays two data sources: 'WorldKMLData' and 'cordis-h2020organizations-cop*'. They are connected by a relationship line with a small orange circle in the center, indicating a medium level of common values. Below the diagram, a data table is visible. The table has two tabs: 'CountryISO_2Char' (selected) and 'CountryISO_2Char-country'. The 'CountryISO_2Char' tab shows a list of country codes (AW, AF, AO, AI, AL) with a highlighted orange background. The 'CountryISO_2Char-country' tab shows a table with columns: 'CountryISO_2Char', 'activityType', 'endOfParticipation', 'ecContribution', 'country', and 'street'. The data rows are as follows:

CountryISO_2Char	activityType	endOfParticipation	ecContribution	country	street
AW	HES	0	259560	BE	Avenue Franklin Roosevelt 50
AF	HES	0	546575,76	UK	Northcote House, The Queen's Drive
AO	RSITET	HES	0	SE	SANKT OLOFSGATAN 10 B
AI	REC	0	498432,96	DE	HOFGARTENSTRASSE 8
AL	REC	0	788626,8	FR	Rue Michel -Ange 3

Hands on exercise

Visualising CORDIS Data

Adding a Map

*Click on the association name and rename it to “Country” for simplicity.
Then click on “Load data”, at the top right corner to include the new data in your app.*

The screenshot shows the Qlik Sense interface with a data association between 'WorldKMLData' and 'cordis-h2020organizations-cop'. The association name is being edited to 'Country'. A 'Load data' button is highlighted in the top right. Below, a table shows data for various countries.

CountryISO_2Char	activityType	endOfParticipation	ecContribution	country	street
AW	HES	0	250560	BE	Avenue Franklin Roosevelt 50
AF	HES	0	546575,76	UK	Northcote House, The Queen's Drive
AO	RSITET	HES	0	SE	SANKT OLOFGATAN 10 B
AI	REC	0	498432,96	DE	HOFGARTENSTRASSE 8
AL	REC	0	788626,8	FR	Rue Michel-Ange 3

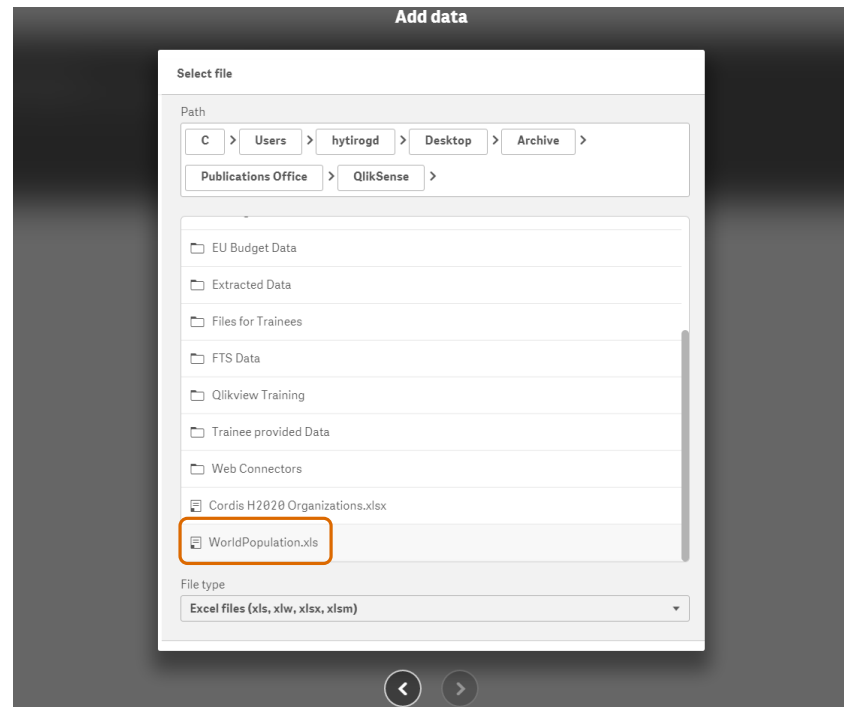
Hands on exercise

Visualising CORDIS Data

Adding a Map

We will also add some country population data to use later on.

Navigate to and select the “WorldPopulations.xls” file. Click next.



Hands on exercise

Visualising CORDIS Data

Adding a Map

Drag the populations source on to the WorldKMLData source.

Create an association between the “CountryISO_3Char” and the “Country Code” fields and rename it “Country ISO3”.

Then click on “Load data”, at the top right corner to include the new data in your app.

The screenshot shows the Qlik Sense interface. At the top, two data sources are connected: 'WorldKMLData' and 'Population\$*'. An orange box highlights the connection point between them. Below the sources, a dropdown menu is open, showing a 'Custom association' option. The 'Association name' field is set to 'Country ISO3'. Below this, a table view displays data from both sources. The table has columns for 'WorldCountries.FullName', 'CountryISO_2Char', 'CountryISO_3Char', 'CountryISO_Numeric', 'Country Name', 'Country Code', and 'Population'. The data rows show countries like Aruba, Afghanistan, Angola, Anguilla, and Albania with their respective codes and population values.

WorldCountries.FullName	CountryISO_2Char	CountryISO_3Char	CountryISO_Numeric	Country Name	Country Code	Population
Aruba	AW	ABW	533	Aruba	ABW	103889
Afghanistan	AF	AFG	4	Andorra	AND	70473
Angola	AO	AGO	24	Afghanistan	AFG	32526562
Anguilla	AI	AIA	660	Angola	AGO	25021974
Albania	AL	ALB	8	Albania	ALB	2889167

Hands on exercise

Visualising CORDIS Data

Adding a Map

Upon returning to your sheet, notice that the charts display errors now. This is because now there is an error with a dimension, as we renamed a field name “country” to “Country”.

Simply update the field and your charts will pop back.

The screenshot shows the Qlik Sense interface with two charts and a configuration panel. The left chart, titled "EC Contributions by Country and ...", has a red "Invalid dimension" error message. The right chart, titled "EC Contribution (€) by Country", also has a red "Invalid dimension" error message. The configuration panel on the right shows the "Rows" section with "Invalid dimension" selected, and the "Field" dropdown set to "country". The "Label" field is set to "Country". The "Show null values" checkbox is checked. The "Limitation" is set to "Exact value". The "Calculated on measure" is set to "EC Contribution (€)".

Hands on exercise

Visualising CORDIS Data

Adding a Map

Now let's add the map to our datasheet.

Drag and drop the "Map" chart onto the top right corner of your sheet.

The screenshot shows the Qlik Sense interface for a sheet named 'CORDIS 1'. On the left, a 'Charts' sidebar lists various chart types, with 'Map' highlighted. An orange arrow points from the 'Map' icon in the sidebar to a 'Map' button located in the top right corner of the main grid area. The main grid contains a table titled 'EC Contributions by Country and ...' and a bar chart titled 'EC Contribution (€) by Country'. The table lists countries and their corresponding EC contributions in Euros. The bar chart shows the same data as a bar chart.

Country	EC Contribution (€)
DE	2.751.853.442,92€
UK	2.359.569.619,29€
FR	1.583.171.390,95€
ES	1.353.456.643,02€
IT	1.243.837.042,17€
NL	1.218.256.578,68€
BE	728.001.763,36€
SE	492.081.122,20€
AT	428.482.192,20€
DK	384.247.181,08€
FI	321.058.218,84€
EL	313.643.179,79€
IL	294.974.947,49€

*Countries that received no funds have been omitted from the table

Hands on exercise

Visualising CORDIS Data

Adding a Map

Find the “Country” field in the “Fields” menu under “WorldKMLData” and drag and drop it onto the map chart.

The screenshot shows the Qlik Sense interface for the 'CORDIS 1' dataset. The 'Fields' menu is open, and the 'Country' field is being dragged from the 'WorldKMLData' section to a map chart area. The map chart area is currently empty, with a 'Click to add title' prompt and an 'Add dimension' button. Below the map chart area is a bar chart titled 'EC Contribution (€) by Country' showing the contribution for various countries. The table below the bar chart lists the countries and their corresponding EC contributions in Euros.

Country	EC Contribution (€)
DE	2.751.853.442,92€
UK	2.359.569.619,29€
FR	1.583.171.390,95€
ES	1.353.456.643,02€
IT	1.243.837.042,17€
NL	1.218.256.578,68€
BE	728.601.763,36€
SE	492.081.122,20€
AT	428.482.192,20€
DK	384.247.181,08€
FI	321.058.218,84€
EL	313.643.179,79€
IL	294.974.947,49€

Hands on exercise

Visualising CORDIS Data

Adding a Map

Find the “WorldCountries.ShortName” field in the “Fields” menu under “WorldKMLData” and drag and drop it onto the map chart. Select “Add as area layer”.

The screenshot shows the Qlik Sense interface with the following components:

- Fields Panel:** Shows the 'WorldKMLData' folder selected, with the 'Country' field highlighted.
- Table:** Titled 'CORDIS 1', showing 'EC Contributions by Country and ...'. The table lists countries and their EC contributions in Euros (€).
- Map Chart:** A map chart titled 'EC Contribution (€) by Country' is shown. A context menu is open over the map, with 'Add as area layer' selected.
- Layers Panel:** Shows the 'Data' layer with an 'Add layer' button.
- Appearance Panel:** Shows the 'Background' and 'Add-ons' sections.

Country	EC Contribution (€)
DE	2.751.853.442,92€
UK	2.359.569.619,29€
FR	1.583.171.399,95€
ES	1.353.456.643,02€
IT	1.243.837.042,17€
NL	1.218.256.578,68€
BE	728.601.763,36€
SE	492.081.122,20€
AT	428.482.192,20€
DK	384.247.181,08€
FI	321.058.218,84€
EL	313.643.179,79€
IL	294.974.947,49€

Hands on exercise

Visualising CORDIS Data

Adding a Map

Next we must add the contribution data to our map.

Drag and drop ecContribution onto the map and select “Color by” -> “By measure” -> “Sum(ecContribution)”

The screenshot shows the Qlik Sense interface with the following components:

- Fields Panel:** Lists various fields, with 'ecContribution' highlighted in an orange box.
- Data Panel:** Shows 'WorldCountries.ShortName' as the dimension, also highlighted in an orange box.
- Map Visualization:** A world map with a context menu open. The 'Color by' option is selected, and the 'By measure' sub-menu is open, with 'Sum(ecContribution)' highlighted in an orange box.
- Table:** A table titled 'EC Contributions by Country and ...' showing data for various countries. The table is as follows:

Country	Project	EC Contribution (€)
DE		2.751.853.442,92€
UK		2.359.569.619,29€
FR		1.583.171.390,95€
ES		1.353.456.643,02€
IT		1.243.837.042,17€
NL		1.218.256.578,68€
BE		728.601.763,36€
SE		492.081.122,20€
AT		428.482.192,20€
DK		384.247.181,08€
FI		321.058.218,84€
EL		313.643.179,79€
IL		294.974.947,49€
- Bar Chart:** A bar chart titled 'EC Contribution (€) by Country' showing the contribution for each country. The x-axis lists countries: DE, UK, FR, ES, IT, NL, BE, SE, AT, DK, FI, EL, IL, IE, NO, PT, CH, PL, CZ, HU, SI, TR, RO. The y-axis shows values from 0 to 3G.

Hands on exercise

Visualising CORDIS Data

Adding a Map

The result should look somewhat like this.

CORDIS 1

EC Contributions by Country and Project

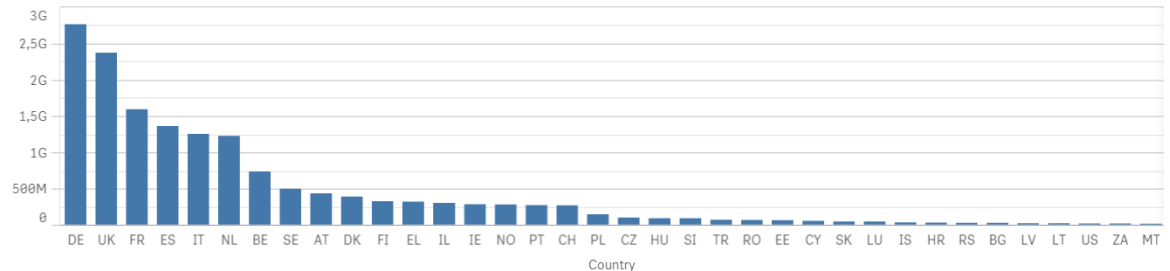
The amounts displayed are taken from the EU ODP CORDIS dataset

Country	Project	EC Contribution (€)
+	DE	2.751.853.442,92€
+	UK	2.359.569.619,29€
+	FR	1.583.171.390,95€
+	ES	1.353.456.643,02€
+	IT	1.243.837.042,17€
+	NL	1.218.256.578,68€
+	BE	728.601.763,36€
+	SE	492.081.122,20€
+	AT	428.482.192,20€
+	DK	384.247.181,08€
+	FI	321.058.218,84€
+	EL	313.643.179,79€
+	IL	294.974.947,49€
+	IE	277.983.823,02€
+	NO	275.228.929,19€

*Countries that received no funds have been omitted from the table



EC Contribution (€) by Country

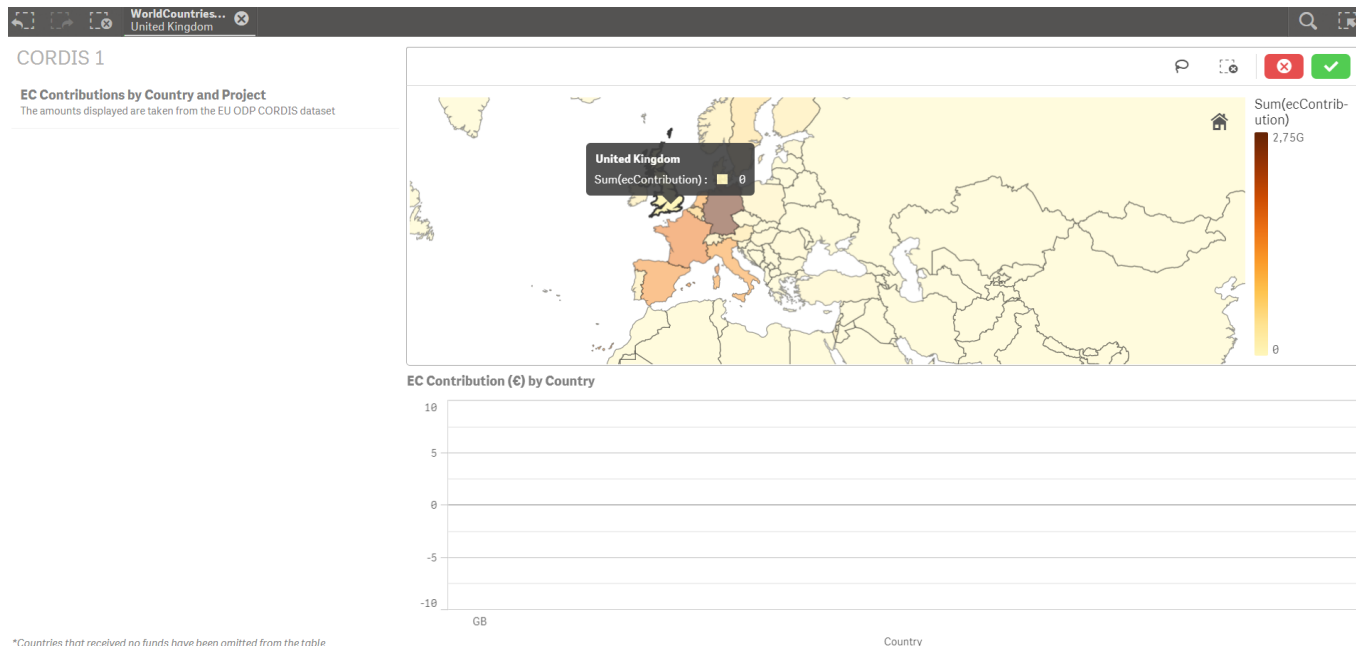


Hands on exercise

Visualising CORDIS Data

Adding a Map

Now when navigating to the “Done” view and selecting the UK on the map, we see that the amount is “0”. Obviously this should not occur. When checking other countries we note that it is the same for Greece and is due to the use of a different country code between the EC, used in CORDIS, and the international ISO-2 specification, used in the WorldKMLData file.



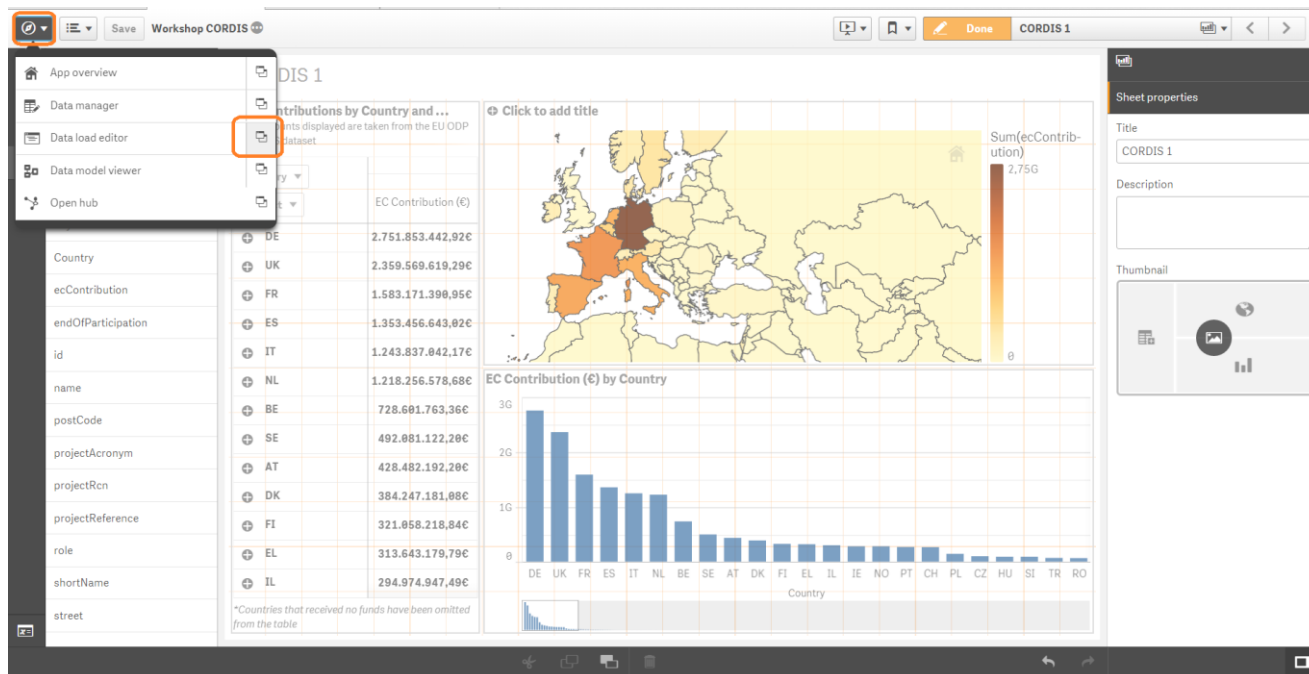
Hands on exercise

Visualising CORDIS Data

Adding a Map

This is a great opportunity to demonstrate one of the most versatile features of Qlik Sense, the “**Data load editor**” and do some scripting.

Click on the “Navigation” button and open the “Data load editor” in a new tab.



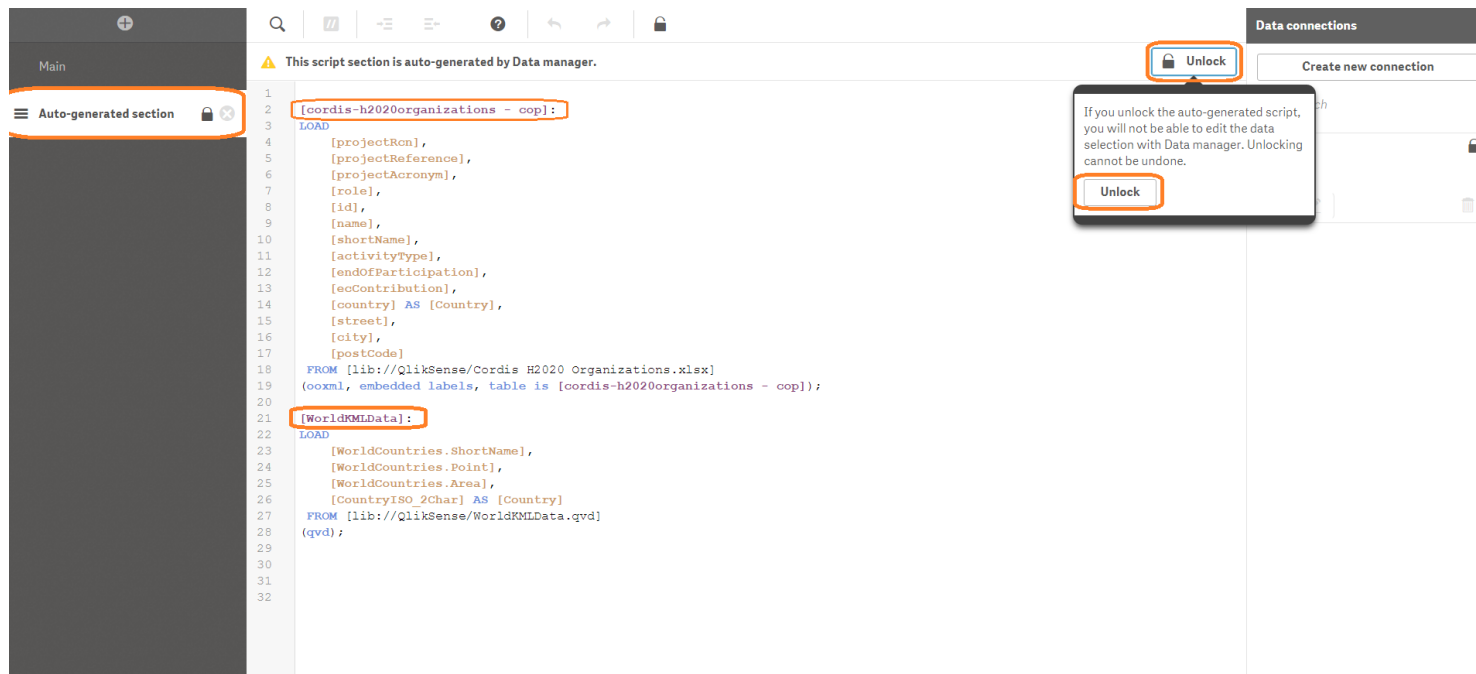
Hands on exercise

Visualising CORDIS Data

Adding a Map

Head to the “Auto-generated section” and click “Unlock” and again “Unlock”.

Here we have automatically generated parameters indicating how to interpret the data contained in our data sources. Notice the purple text indicating our two sources.



The screenshot shows the Qlik Sense Data Manager interface. On the left, the 'Main' pane shows the 'Auto-generated section' selected. The central pane displays a script section that is auto-generated by the Data manager. The script contains two data sources highlighted in purple: '[cordis-h2020organizations - cop]' and '[WorldKMLData:]'. The script includes a 'LOAD' statement for each source, listing various fields like 'projectRcn', 'projectReference', 'projectAcronym', 'role', 'id', 'name', 'shortName', 'activityType', 'endOfParticipation', 'ecContribution', 'country', 'street', 'city', and 'postCode'. The script also includes 'FROM' statements for the data sources: 'FROM [lib://QlikSense/Cordis H2020 Organizations.xlsx] (ooxml, embedded labels, table is [cordis-h2020organizations - cop]);' and 'FROM [lib://QlikSense/WorldKMLData.qvd] (qvd);'. On the right, the 'Data connections' pane shows an 'Unlock' button highlighted with a red box. A tooltip is displayed over the 'Unlock' button, stating: 'If you unlock the auto-generated script, you will not be able to edit the data selection with Data manager. Unlocking cannot be undone.' Below the tooltip is another 'Unlock' button.

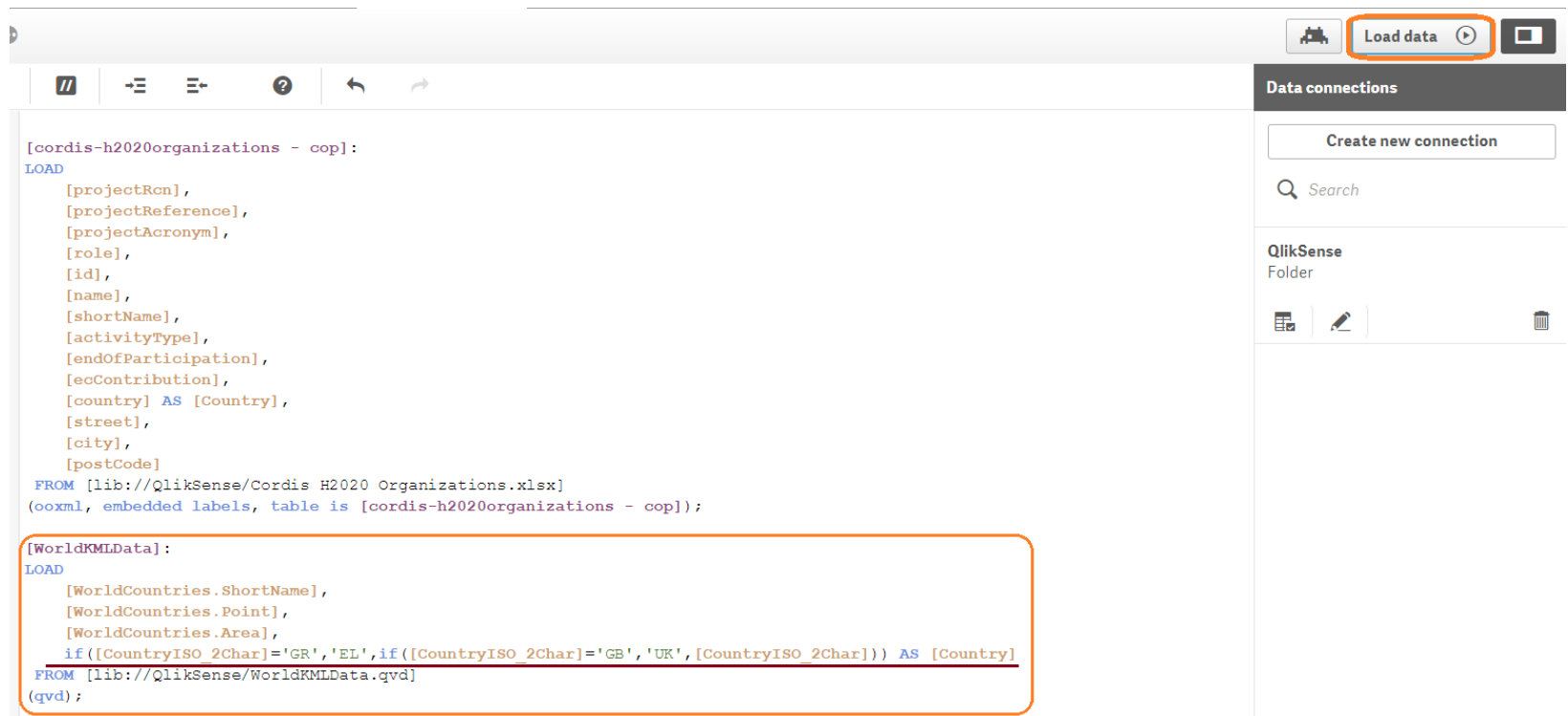
Hands on exercise

Visualising CORDIS Data

Adding a Map

We need to modify the way Qlik Sense[®] loads the data of our “CountryISO_2Char” field, to conform with the code used by the EC.

Modify the line as shown below and click “Load data”.



The screenshot shows the Qlik Sense interface. At the top right, there is a 'Load data' button with a play icon, which is highlighted with an orange box. Below the toolbar, the script editor displays the following code:

```
[cordis-h2020organizations - cop]:
LOAD
    [projectRcn],
    [projectReference],
    [projectAcronym],
    [role],
    [id],
    [name],
    [shortName],
    [activityType],
    [endOfParticipation],
    [ecContribution],
    [country] AS [Country],
    [street],
    [city],
    [postCode]
FROM [lib://QlikSense/Cordis H2020 Organizations.xlsx]
(ooxml, embedded labels, table is [cordis-h2020organizations - cop]);

[WorldKMLData]:
LOAD
    [WorldCountries.ShortName],
    [WorldCountries.Point],
    [WorldCountries.Area],
    if([CountryISO_2Char]='GR','EL',if([CountryISO_2Char]='GB','UK',[CountryISO_2Char])) AS [Country]
FROM [lib://QlikSense/WorldKMLData.qvd]
(qvd);
```

The line `if([CountryISO_2Char]='GR','EL',if([CountryISO_2Char]='GB','UK',[CountryISO_2Char])) AS [Country]` is highlighted with an orange box. On the right side of the interface, there is a 'Data connections' panel with a 'Create new connection' button and a search bar. Below that, there is a 'QlikSense Folder' section with a grid icon, a pencil icon, and a trash icon.

Hands on exercise

Visualising CORDIS Data

Adding a Map

We need to modify the way Qlik Sense® loads the data of our “CountryISO_2Char” field, to conform with the code used by the EC.

Modify the line as shown below and click “Load data”.

CODE:

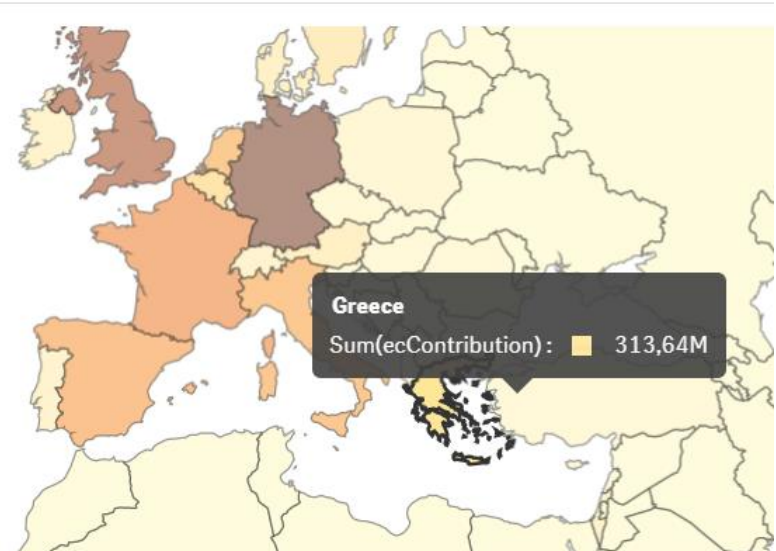
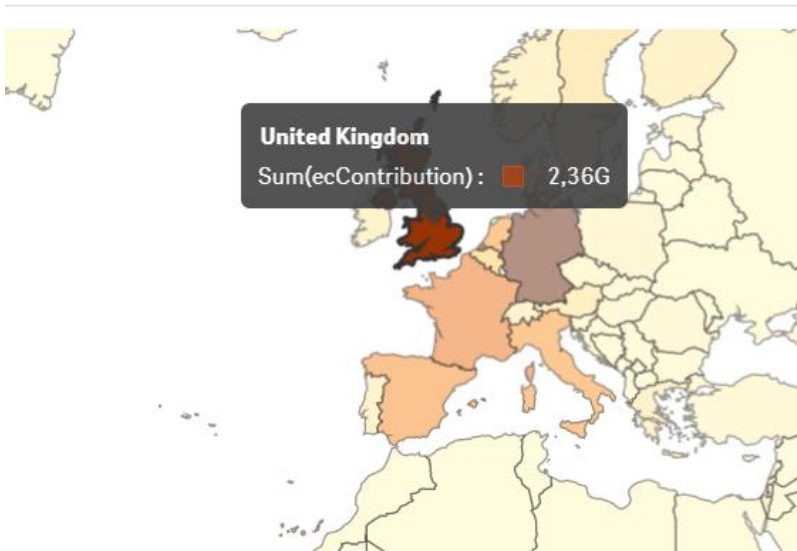
```
if([CountryISO_2Char]='GR','EL',if([CountryISO_2Char]='GB','UK',[CountryISO_2Char])) AS [Country]
```

Hands on exercise

Visualising CORDIS Data

Adding a Map

Going back to your sheet, the UK and Greece should now both display a value.

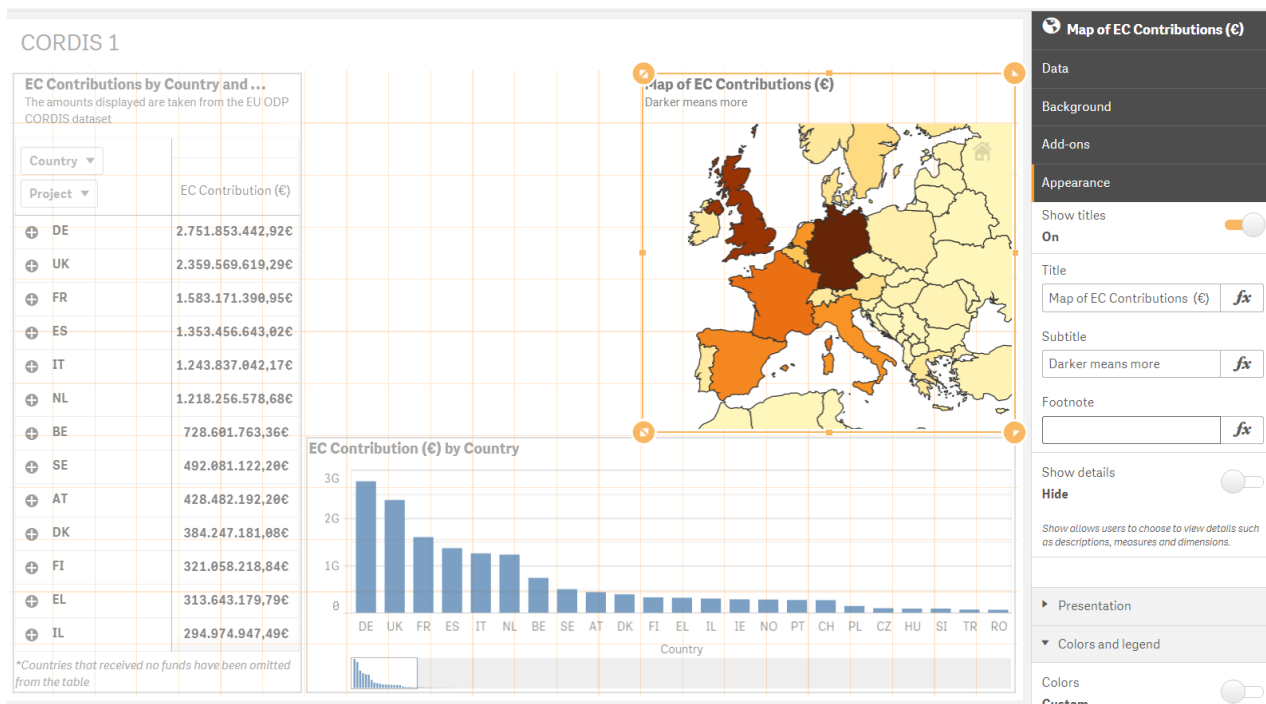


Hands on exercise

Visualising CORDIS Data

Adding a Map

Now that we have our data working, let's finalise the appearance of our map.
Add a title, remove the legend and position it at the right in a square shape.

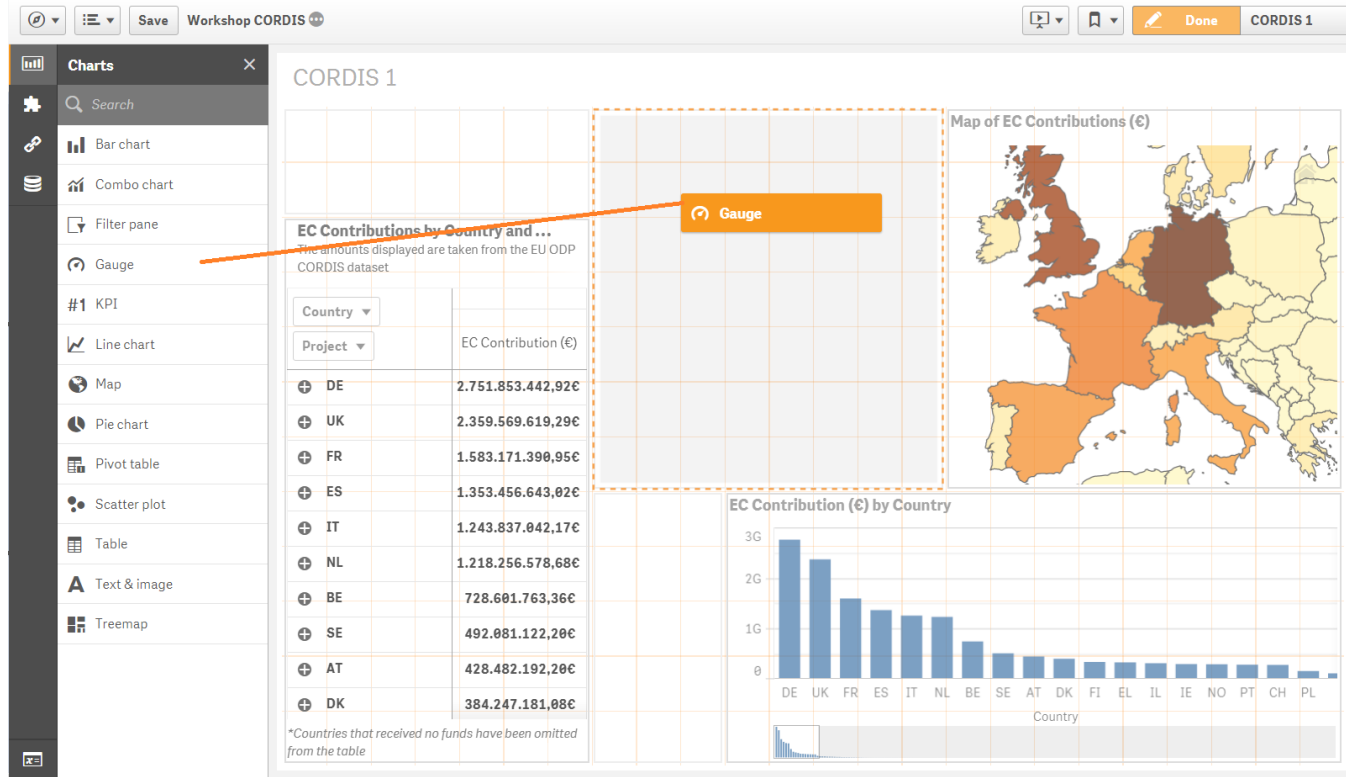


Hands on exercise

Visualising CORDIS Data

Adding a Gauge

Now we will add a gauge to sum up our selections and display the part of total we have gathered. *Drag and drop the gauge chart onto your sheet.*

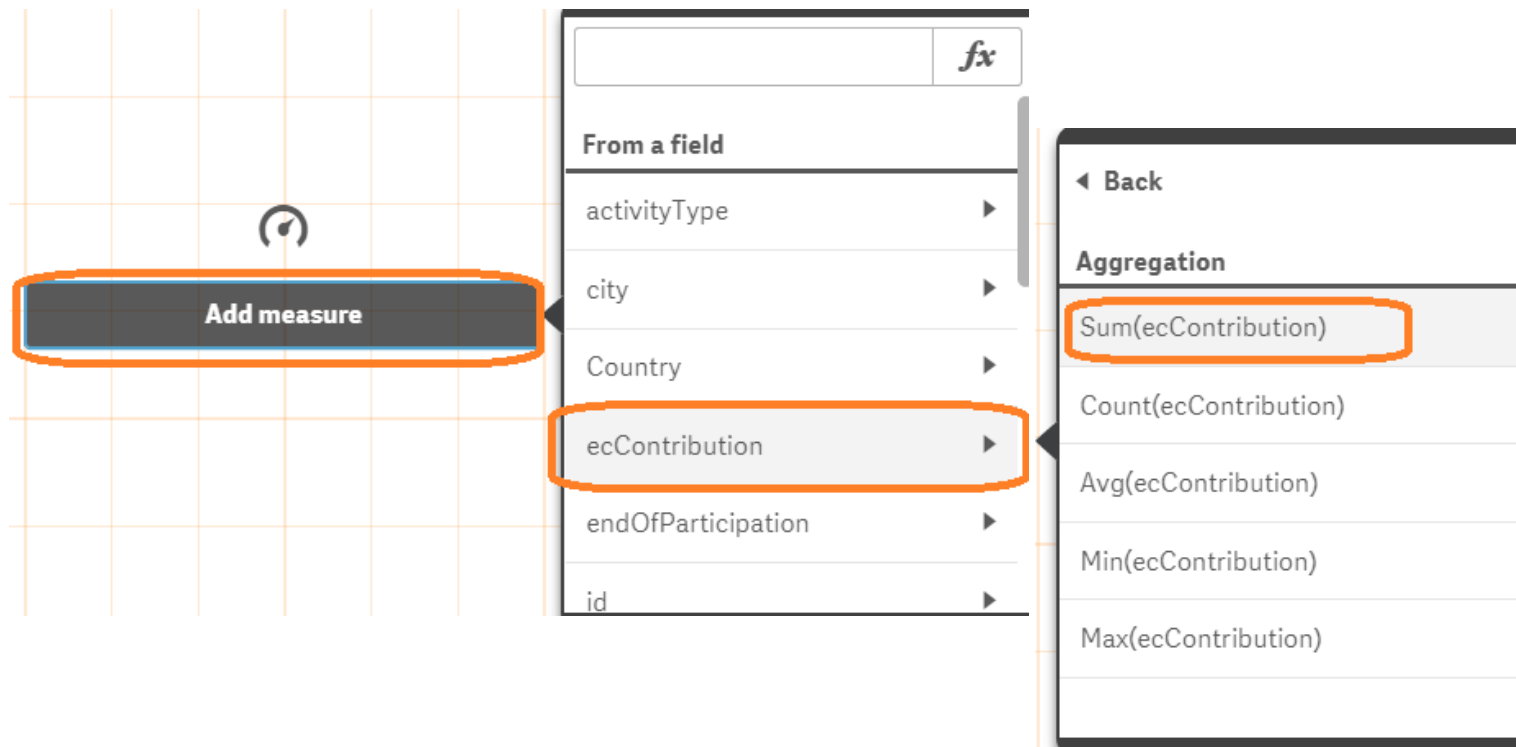


Hands on exercise

Visualising CORDIS Data

Adding a Gauge

Add the measure “ecContribution” to your gauge.



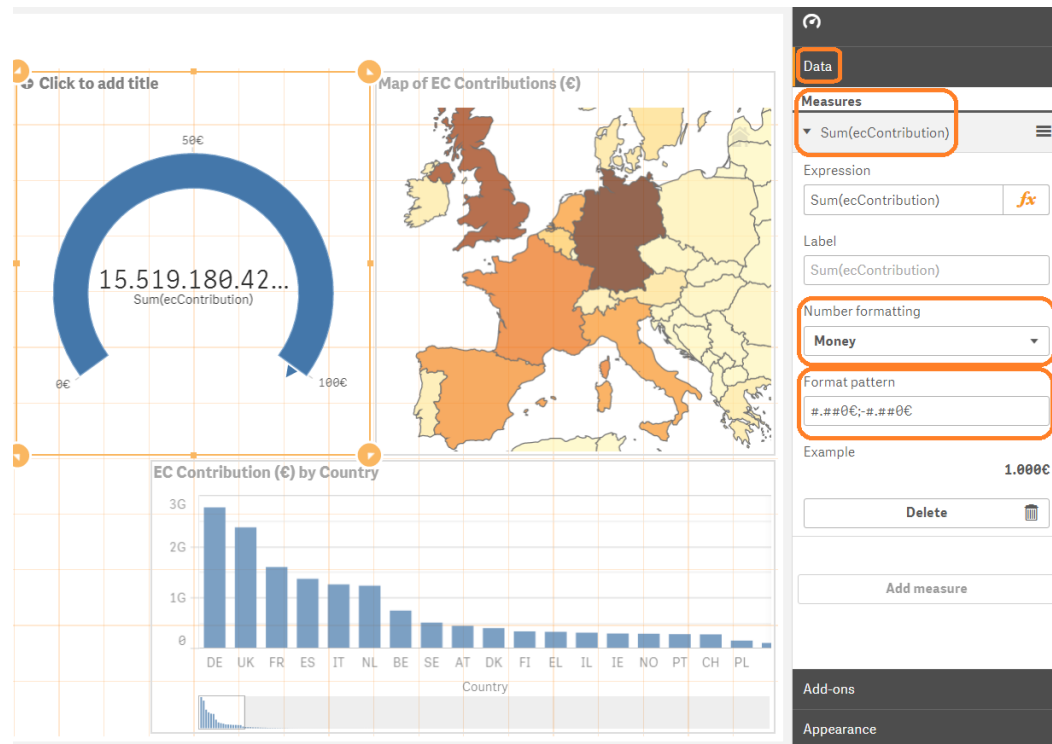
Hands on exercise

Visualising CORDIS Data

Adding a Gauge

Now let's refine our gauge according to our purpose.

From the Measures menu, under data, format the values to appear in “€” and without decimals.



Hands on exercise

Visualising CORDIS Data

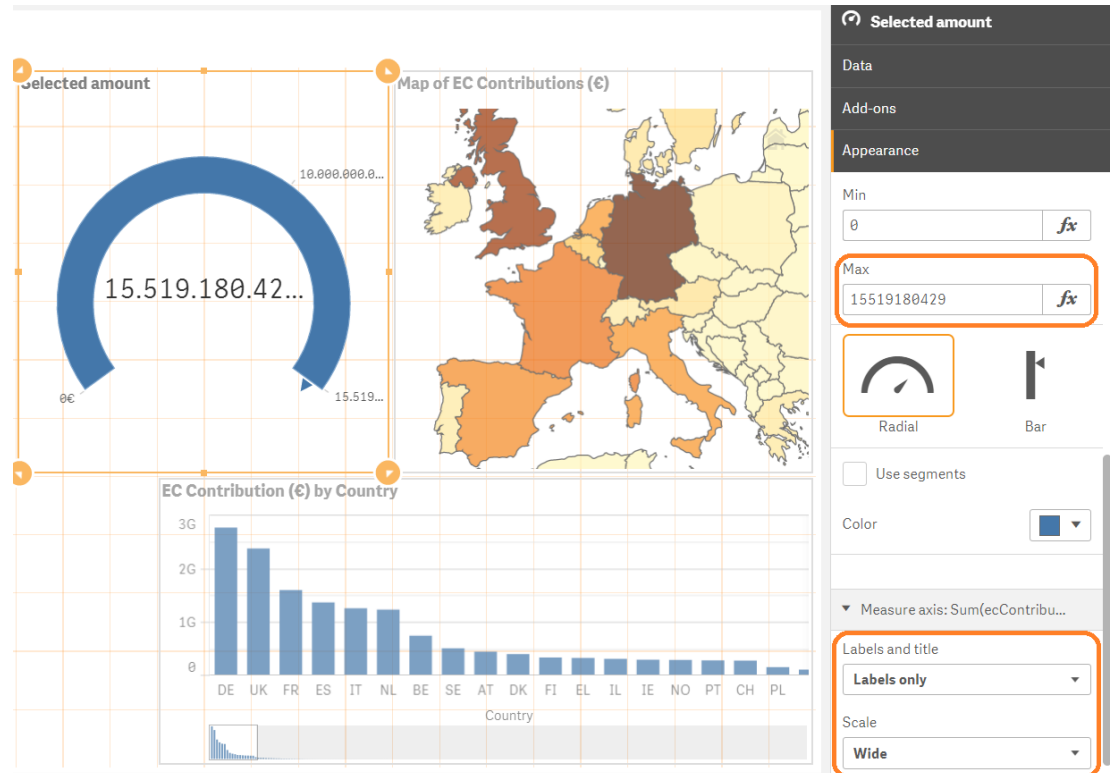
Adding a Gauge

Now let's refine our gauge according to our purpose.

From the Appearance menu, under presentation, add a range limit of Max=15519180429 as that is the total amount of contributions.

Also format for "Labels only" and a "Wide" scale.

Finally add a title.



Hands on exercise

Visualising CORDIS Data

Adding a Logo

Now let's add a finishing touch to our sheet.

Drag and drop a "Text & image" chart onto your sheet.



Hands on exercise

Visualising CORDIS Data

Adding a Logo

Head to the following path in your computer:

C:\Users\<user>\Documents\Qlik\Sense\Content\Default

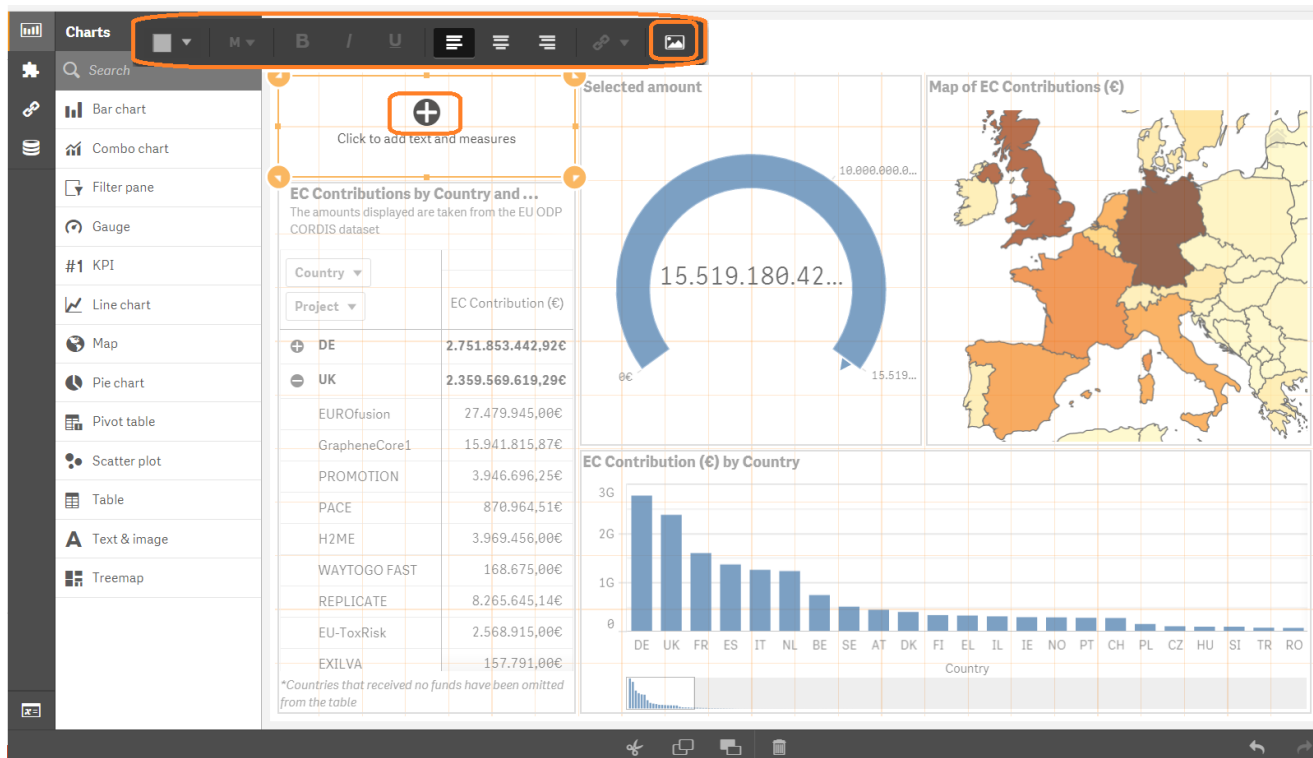
Copy and paste into this folder a file of your choice from the collection of European Commission logos.

Hands on exercise

Visualising CORDIS Data

Adding a Logo

Click on the cross and from the menu that appears click on the image icon at the right.

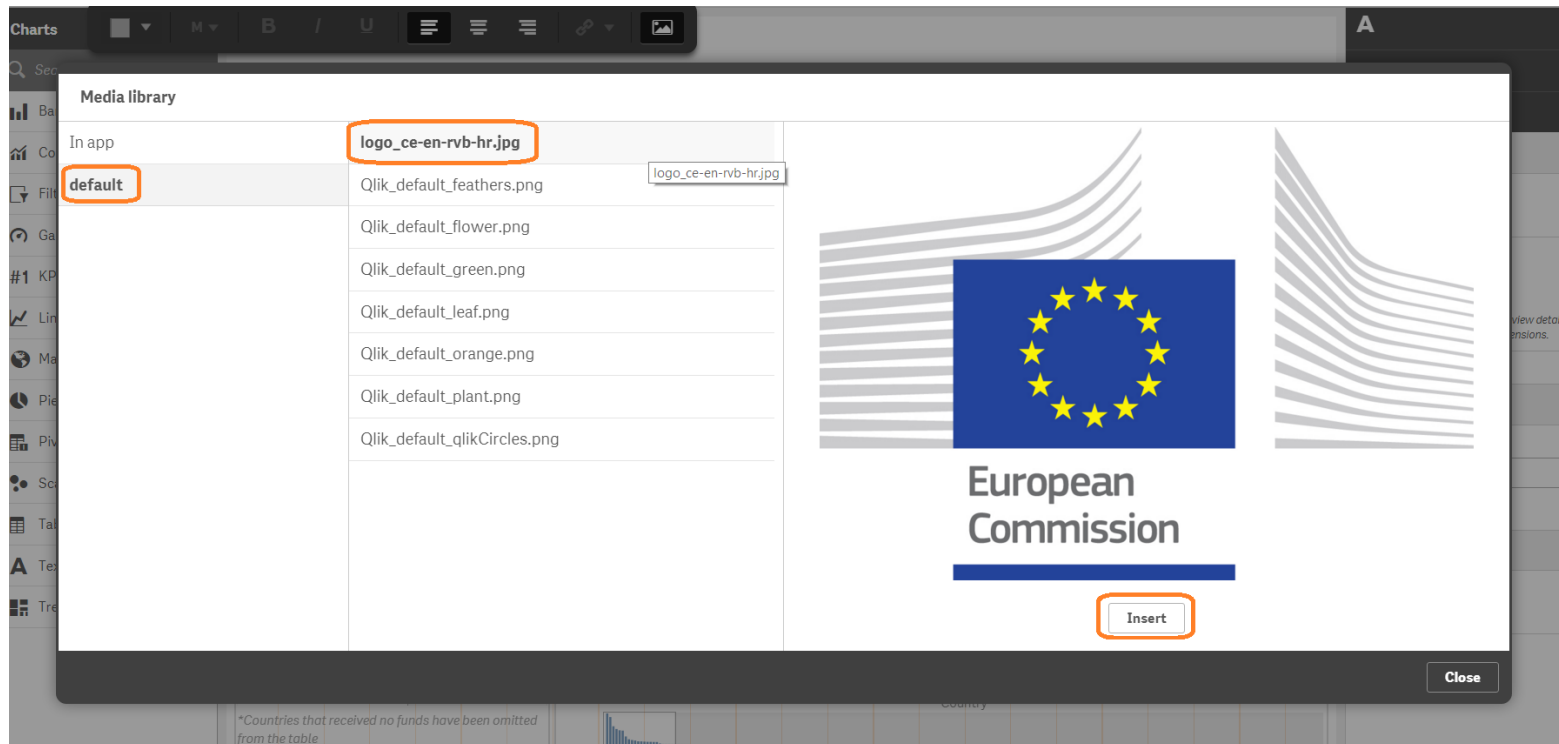


Hands on exercise

Visualising CORDIS Data

Adding a Logo

Find the logo you added in the default folder and click “Insert”.



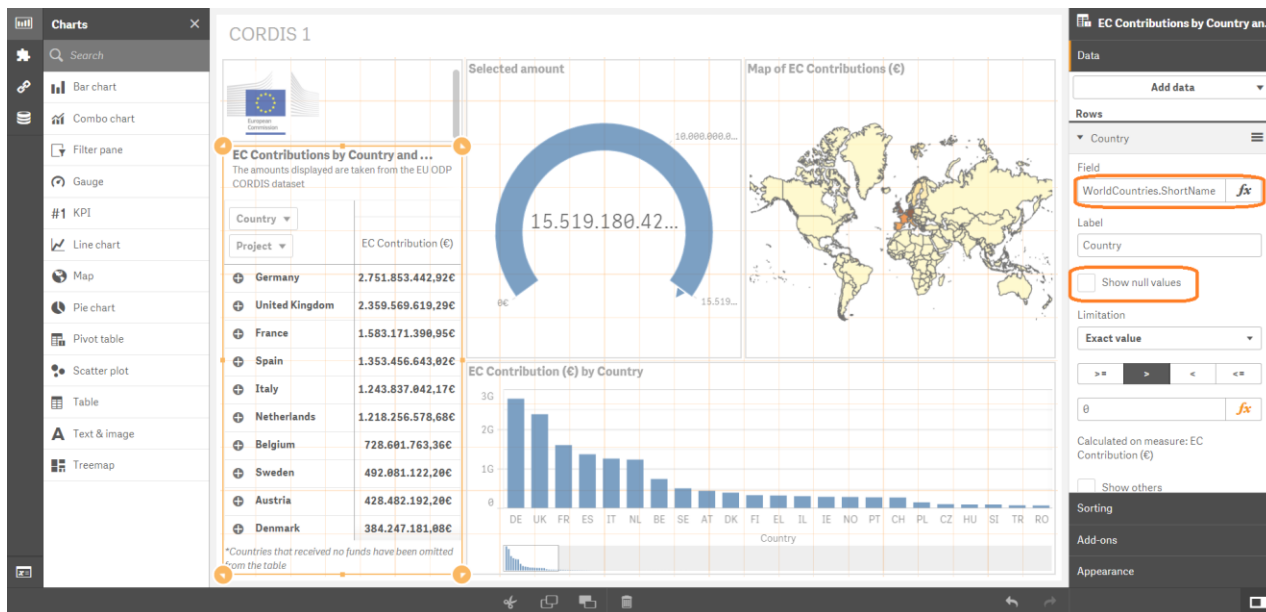
Hands on exercise

Visualising CORDIS Data

Adding a Logo

Finally, now that we have our new data including country names we can make them appear in our pivot table as well, making it more readable. *Select it and change the field to “WorldCountries.ShortName” and de-select “Show null values”.*

Remember! Each name is still connected with the correct contribution value through the common “Country” field.



Hands on exercise

Visualising CORDIS Data

First sheet done!

Click on “Done” and admire your first sheet. Congratulations!

CORDIS 1

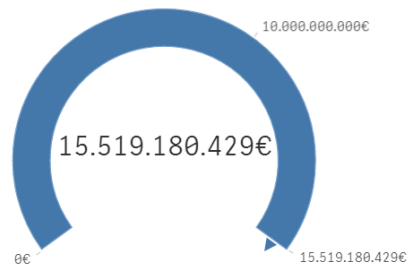


EC Contributions by Country and Project
The amounts displayed are taken from the EU ODP CORDIS dataset

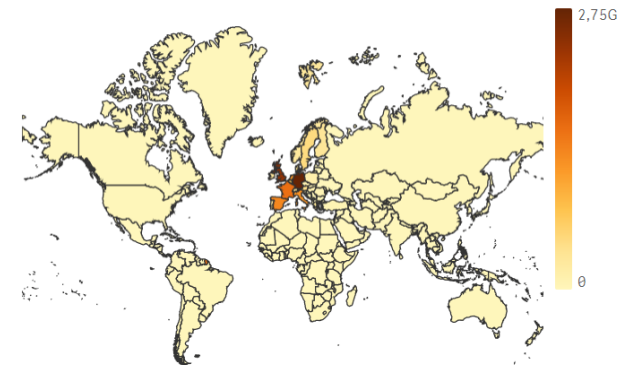
Country	Project	EC Contribution (€)
+ Germany		2.751.853.442,92€
+ United Kingdom		2.359.569.619,29€
+ France		1.583.171.390,95€
+ Spain		1.353.456.643,02€
+ Italy		1.243.837.042,17€
+ Netherlands		1.218.256.578,68€
+ Belgium		728.601.763,36€
+ Sweden		492.081.122,20€
+ Austria		428.482.192,20€
+ Denmark		384.247.181,08€
+ Finland		321.058.218,84€
+ Greece		313.643.179,79€

*Countries that received no funds have been omitted from the table

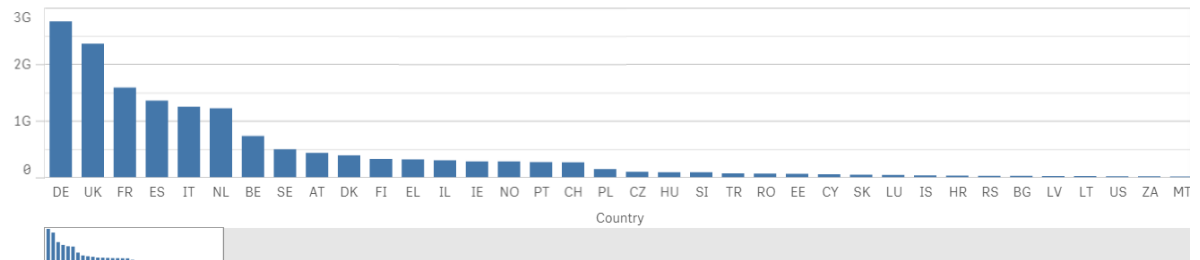
Selected amount



Map of EC Contributions (€)



EC Contribution (€) by Country



Hands on exercise

Visualising CORDIS Data

Shifting perspective

However! There is a slight issue with this sheet. As we by now all agree, visualisations can be misleading. In this case and particularly due to the map and bar chart, one could come to the conclusion that certain countries are granted an uneven amount of funds. But is this really the case..?

CORDIS 1



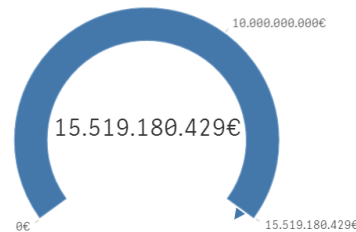
EC Contributions by Country and Project

The amounts displayed are taken from the EU ODP CORDIS dataset

Country	Project	EC Contribution (€)
Germany		2.751.853.442,92€
United Kingdom		2.359.569.619,29€
France		1.583.171.390,95€
Spain		1.353.456.643,02€
Italy		1.243.837.042,17€
Netherlands		1.218.256.578,68€
Belgium		728.601.763,36€
Sweden		492.081.122,20€
Austria		428.482.192,20€
Denmark		384.247.181,08€
Finland		321.058.218,84€
Greece		313.643.179,79€

*Countries that received no funds have been omitted from the table

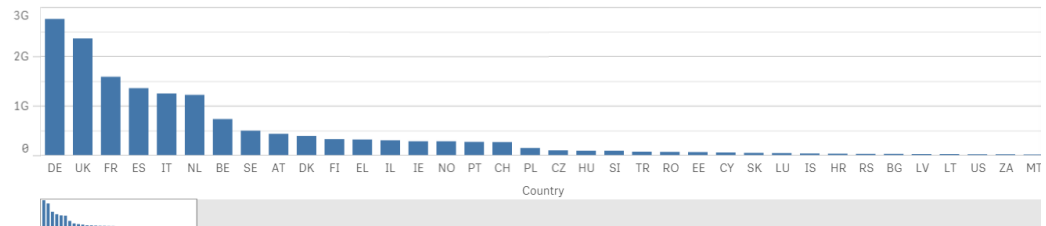
Selected amount



Map of EC Contributions (€)



EC Contribution (€) by Country

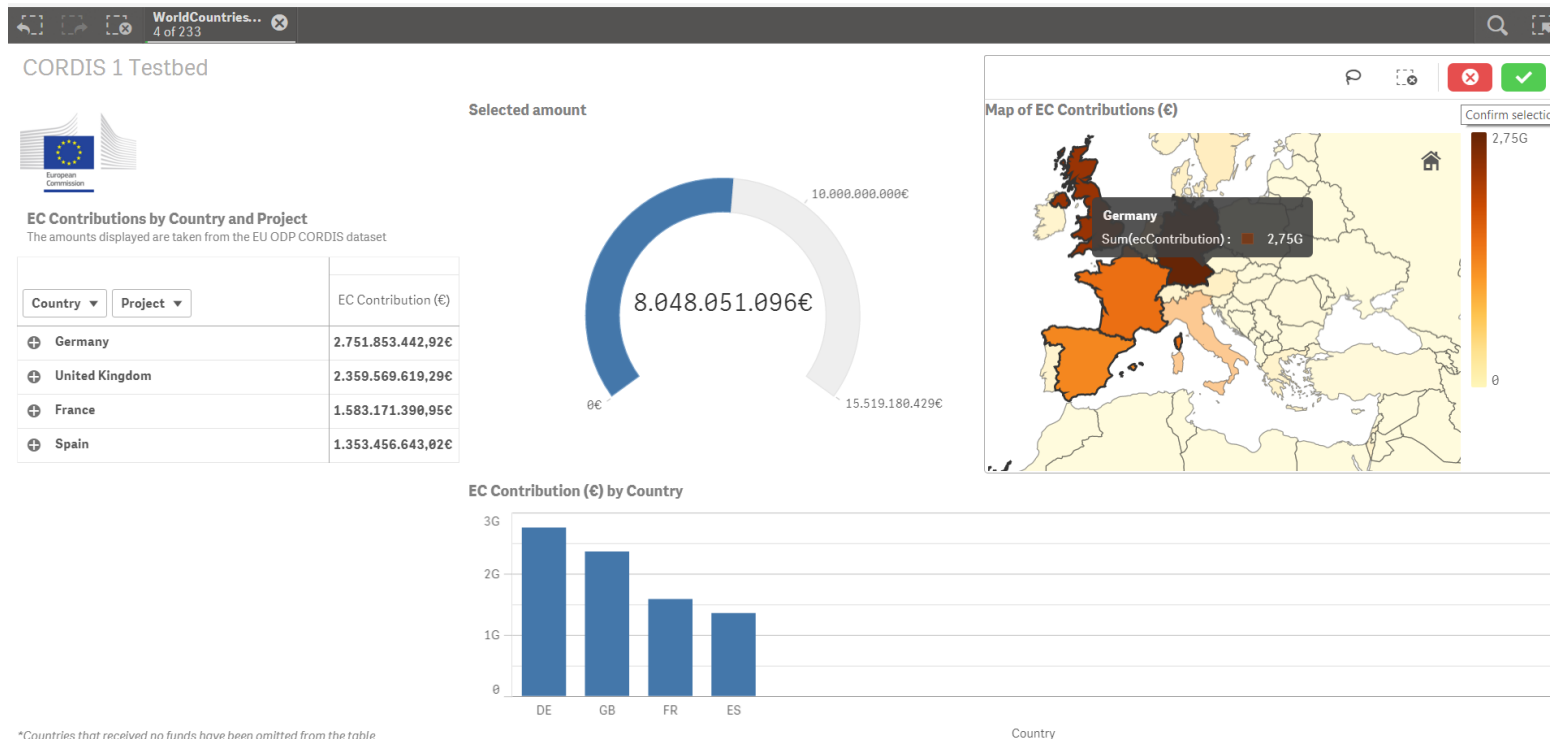


Hands on exercise

Visualising CORDIS Data

Shifting perspective

By selecting just the 4 top countries we are already get over 50% of the total contributions.



Hands on exercise

Visualising CORDIS Data

Shifting perspective

This is a very good example of “shifting the perspective” and changing the lens through which we view a matter.



Be aware that the viewer may not always have all information necessary to fully understand the context. Still as an analyst of the data it is important to gather the correct insights into the data.

So to illustrate the importance of different perspectives on the same data, let us add the population per country into the mix and view the same information per capita!

This should provide us with different insights.

Hands on exercise

Visualising CORDIS Data

Shifting perspective

Open your sheets menu, right-click on your first sheet and select “Duplicate”.
Rename the duplicate sheet to “CORDIS per Capita” and open it.

The screenshot displays the Qlik Sense interface. The main view shows a table titled "EC Contributions by Country and Project" with columns for Country, Project, and EC Contribution (€). Below the table is a bar chart showing the EC Contribution for each country. The "Sheets" menu is open, showing a list of sheets: "CORDIS 1 Testbed per capita" (selected), "Testbed", and "Create new sheet". The "Duplicate" option is highlighted in the context menu, and the "CORDIS 1 per Capita" sheet is highlighted in the sheet list. The "Title" field in the sheet list is also highlighted, showing the text "CORDIS 1 per Capita".

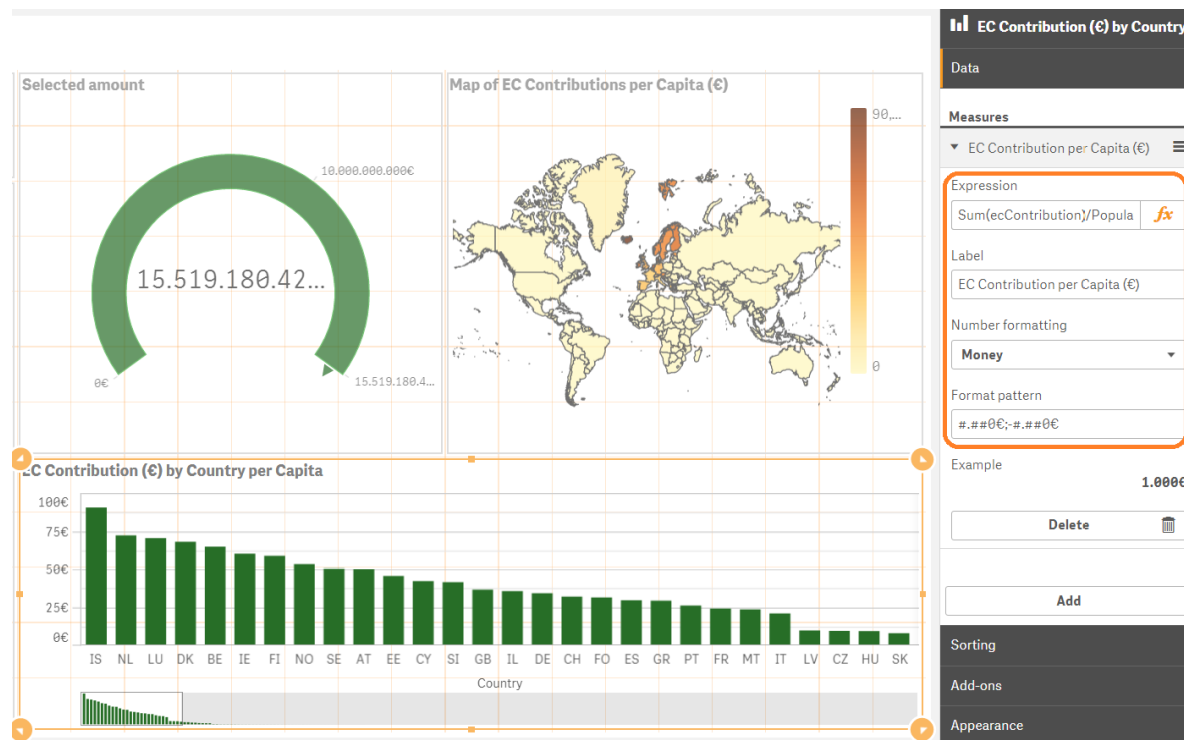
Country	Project	EC Contribution (€)
Germany		2.751.853.442,92€
United Kingdom		2.359.569.619,29€
France		1.583.171.390,95€
Spain		1.353.456.643,02€
Italy		1.243.837.042,17€
Netherlands		1.218.256.578,68€
Belgium		728.601.763,36€
Sweden		492.081.122,20€
Austria		428.482.192,20€
Denmark		384.247.181,08€

Hands on exercise

Visualising CORDIS Data

Shifting perspective

Select the Barchart and modify the fields of its “Data” menu accordingly.
Also change the barchart’s and the gauge’s colour to green to differentiate from the other sheet.



Hands on exercise

Visualising CORDIS Data

Shifting perspective

Select the Map and modify the colouring option accordingly.

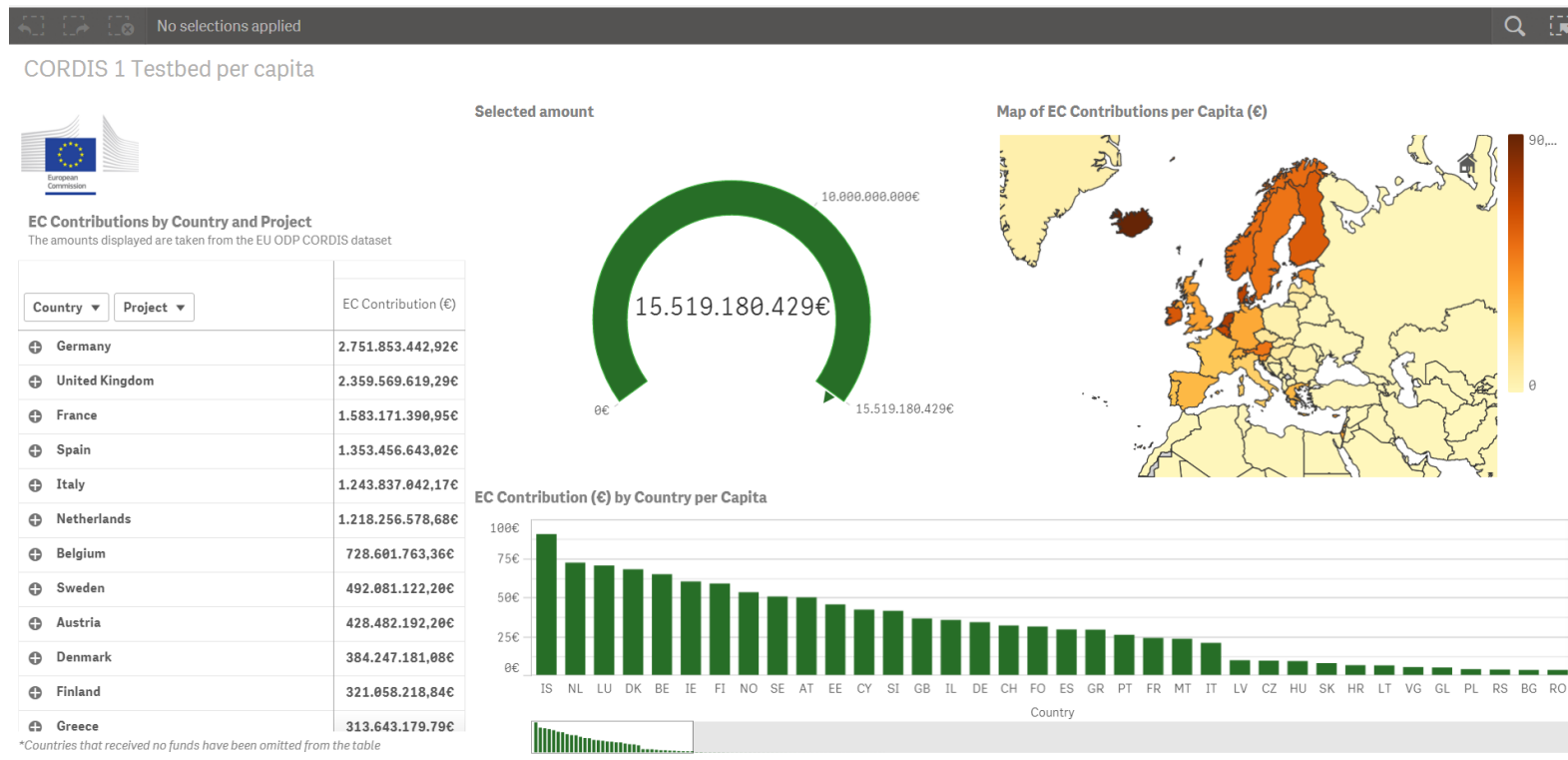


Hands on exercise

Visualising CORDIS Data

Shifting perspective

Now click on “Done” and witness a quite different, and indeed more equal distribution of funds than previously!



Qlik Sense[®] other features

Qlik Sense[®] other features

Stories



Qlik Sense's **Stories** feature offers a simple and easy way for showcasing one's insights to others. Stories allows you to create slides that combine conventional presentation features with content captured in a handy way from your Qlik Sense sheets.

The stories created can be shared through the cloud or saved in PDF form to print.

Data storytelling in Qlik Sense[®] follows the simple methodology below:

1. Collecting insights
2. Selecting useful insights
3. Building a story
4. Emphasise important information
5. Present the finished story

Qlik Sense[®] other features

Qlik Cloud



With Qlik Sense[®] you can also create app on the Qlik Cloud or upload any app you created locally to it. The cloud offers the same environment as Qlik Sense[®] desktop, but can be accessed from anywhere with an internet connection.

When your app is ready you can publish it and share it with other users. A published app is not editable. This means that others will not be able to edit your published sheets and stories, but they will be able to use them to analyse the data. If needed you can update sheets that you have published, and republish them.

Qlik Cloud: eu.qlikcloud.com

Qlik Sense[®] other features

Qlik Sense[®] on mobile



To access your apps and stories on mobile you simply need to navigate to your Qlik Cloud or server on which you're hosting your Qlik Sense[®] implementation through your mobile device. Once there you can explore everything like normal as it automatically adapts to your screen.



Hands on exercise



Hands on exercise

Context

In this section we will let you work independently on some exercises in Qlik Sense®.

You will find all the exercises in the app and other accompanying files provided by us.

These exercises will contain new functionalities not covered in the CORDIS exercise to further understand the possibilities of Qlik Sense®.

The data set provided is a fictional sales dataset.

Here is an overview of what we will cover during these exercises:

- Custom measures
- Drill-down dimensions
- Rank functions
- Set Analysis
- etc.

Hands on exercise

Reference guide

Creating Variables

Variables are objects whose values are not fixed, but are calculated according to current conditions when called within an expression.

An example of a variable is the following:

- **=max(MonthNum) - 1**

In this example the variable calculates the maximum value of the MonthNum field and then subtracts 1. This is a common trick used to calculate previous years to a current selection.

Hands on exercise

Reference guide

Calculation Condition

In the “Add-ons” menu of some visualisations you can add a “Calculation condition” for when the chart should appear or not.

This comes in handy when it doesn’t make sense for a chart to be drawn unless some conditions apply.

An example of a calculation condition is the following:

- **`if(GetSelectedCount(FIELD)>=1,1,0)`**

Hands on exercise

Reference guide

Reference Line

In the “Add-ons” menu of some visualisations you can add a “Reference line” to compare against.

This is useful when you have a benchmark value you want to check against. The reference line is calculated with an expression.

An example of a reference line expression is the following:

- `=avg(TOTAL Aggr(sum(Sales), [%OrderDate.autoCalendar.YearMonth]))`

In this example the reference line indicates the average sales.

Hands on exercise

Reference guide

IF Statements

If statements are used when we need to calculate the value of a measure while taking into account multiple possibilities for our criteria.

An IF statement always follows the **IF(condition, then, else)** syntax.

An example of a reference line expression is the following:

- **=IF(sum(Sales)>=10, 'blue', 'magenta')**

In this example an if statement is used to colour a field based on its possible values.

Hands on exercise

Reference guide

Set analysis Basics

Set analysis is a technique used to create and view multiple concurrent subsets of our dataset.

It is a necessary process when we need to compare between sections of our data or visualise data irrespective of the selections made.

Hands on exercise

Reference guide

Set analysis Syntax

A set expression always starts and ends with curly brackets { }

```
sum( { $ < Year = { 2010 } > } LineSalesAmount)
```

```
sum( { $ < Year = { 2010,2009 } > } LineSalesAmount)
```

```
sum( { $ < Year = { 2010 }, SalesPerson = { 'Elvis Presley' } > } LineSalesAmount)
```

```
sum( { $ < Year = { 2010 }, SalesPerson = { '*' } > } LineSalesAmount)
```

```
sum( { $ < Year = { 2010 }, Month = > } LineSalesAmount)
```

```
sum( { 1 < Year = { 2010 } > } LineSalesAmount)
```

Hands on exercise

Reference guide

Set analysis Dataset Selectors

The **\$** operator indicates to calculate the set based on current selection.

The **1** operator indicates to calculate the set based on the whole dataset and irrespective of selection.

Remember! Everything is case sensitive in Qlik Sense[®] expressions, this includes field, dimension, measure and variable names, and field values.

Hands on exercise

Reference guide

Set analysis Wildcards

When creating items such as measures, dimensions and variables there are certain “wildcard” characters that can be used:

- The question mark ? symbol indicates a single unknown character.
- The asterisk * symbol indicates none, one, or more unknown characters.

Hands on exercise

Reference guide

Quotes in expressions

The single quotes ‘ ’ indicate a value. They are use for example to indicate the values in a comparison expression e.g. CustomerName=‘John’

The double quotes “ ” operator indicates to calculate a value according to some criteria, such as by using wildcards.

Remember! Single ‘ ’ and double “ ” quotes shouldn’t be used interchangeably.

Individual Projects



Questions



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