Data Visualisation
Qlik Sense®

pwc

Contents

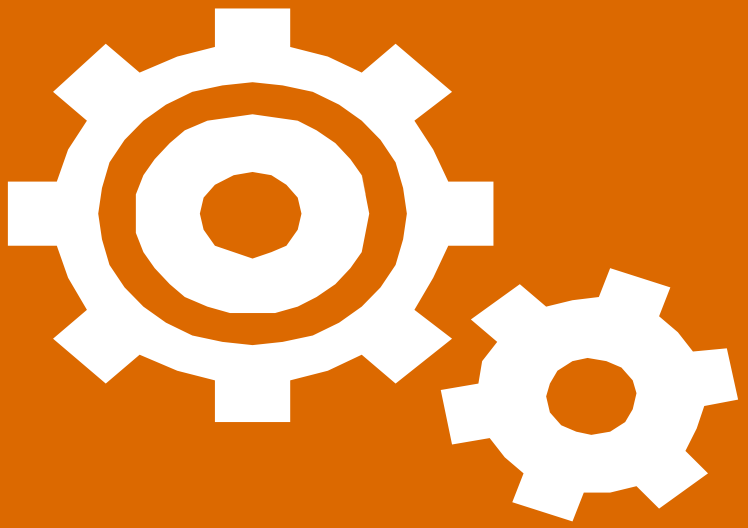
Contents

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

Formulate the question

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?

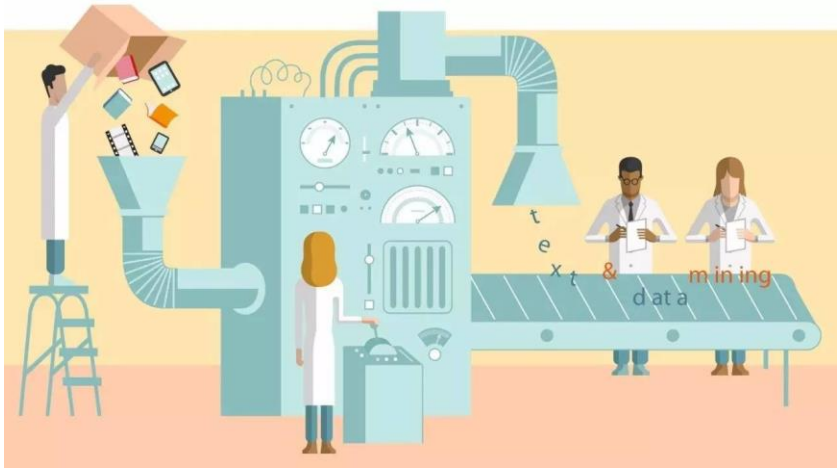
Visualisation Process

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:

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

- 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:

- 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”

- 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

- 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

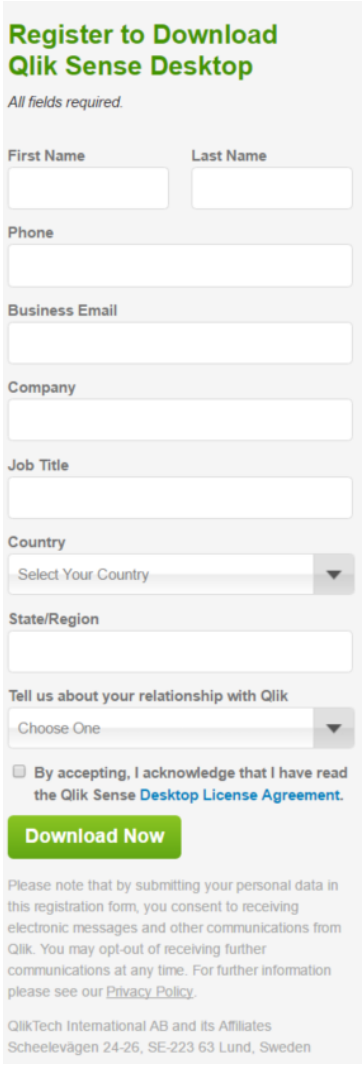
Qlik Sense® installation process

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.



Qlik Sense® basics

Qliksense® basics

Overview

Associative selection model

Selection colours

Apps

Sheets

Visualisations

Functions

Expressions

Dimensions

Measures

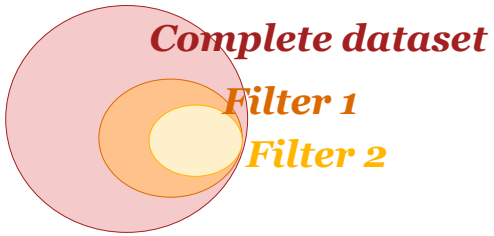
Master items

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.

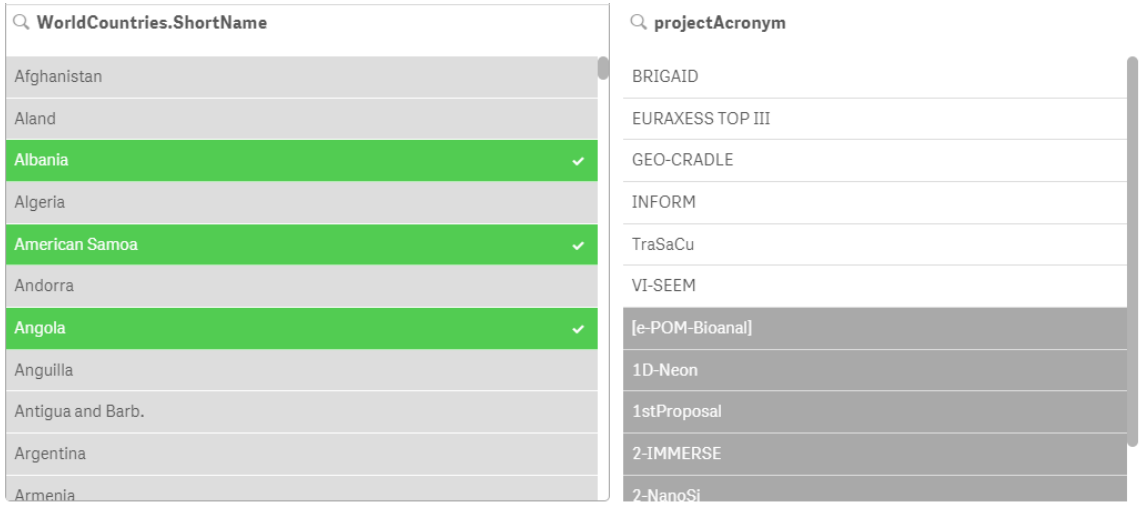


- This means that the more selections one makes the more he refines the focus of his selection.

Qlik Sense® basics
Selection colours

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

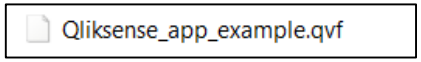
- indicates selected values;
- indicates associated values;
- indicates non-associated values.

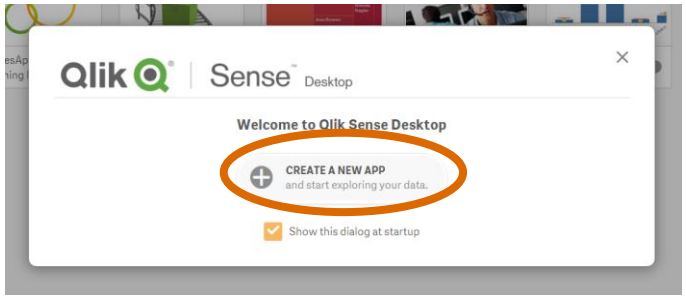


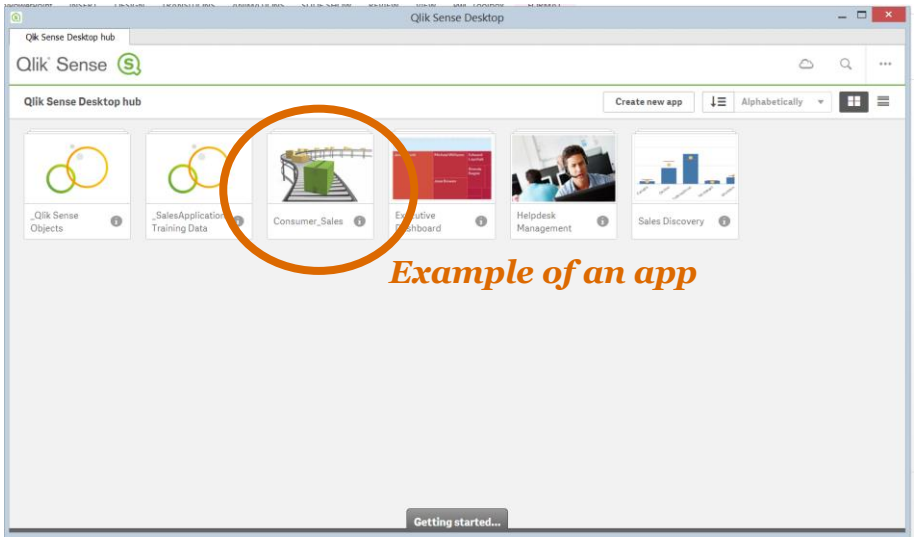
Qlik Sense® basics
Apps

- 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:





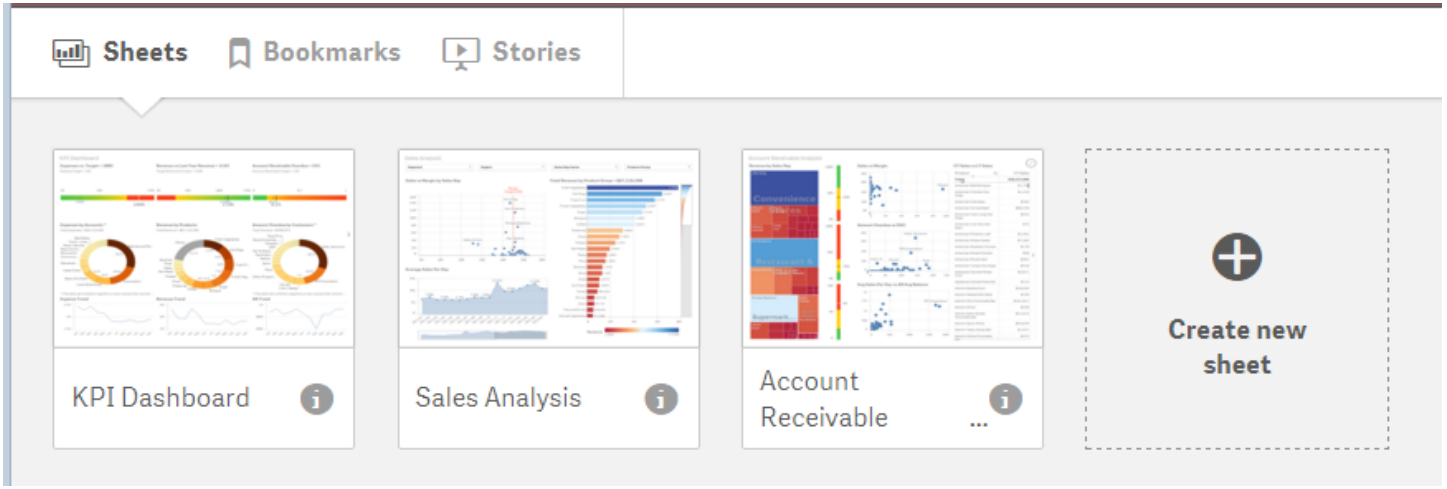


Example of an app

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 one sheet affect the visualisations on the other sheets as well.



Qlik Sense® basics
Visualisations

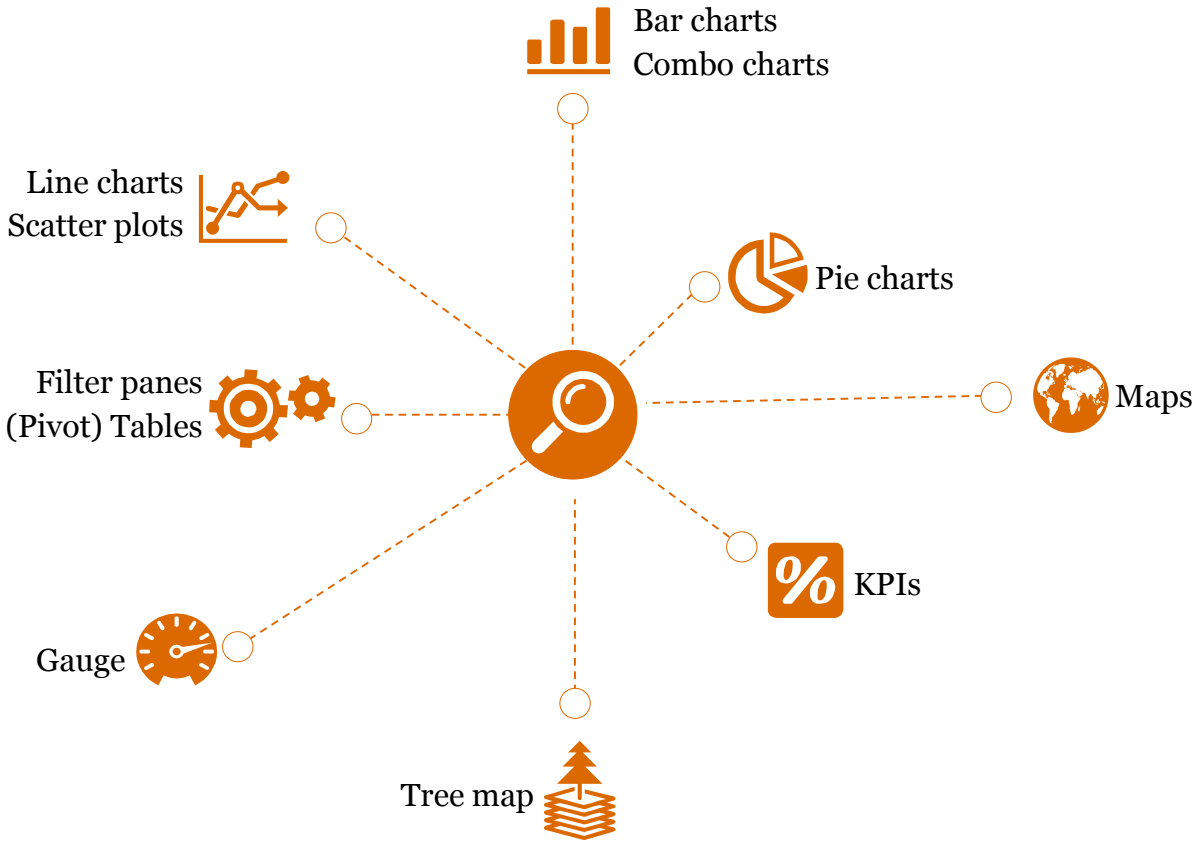
Visualizations are used to present the data loaded in the app.

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

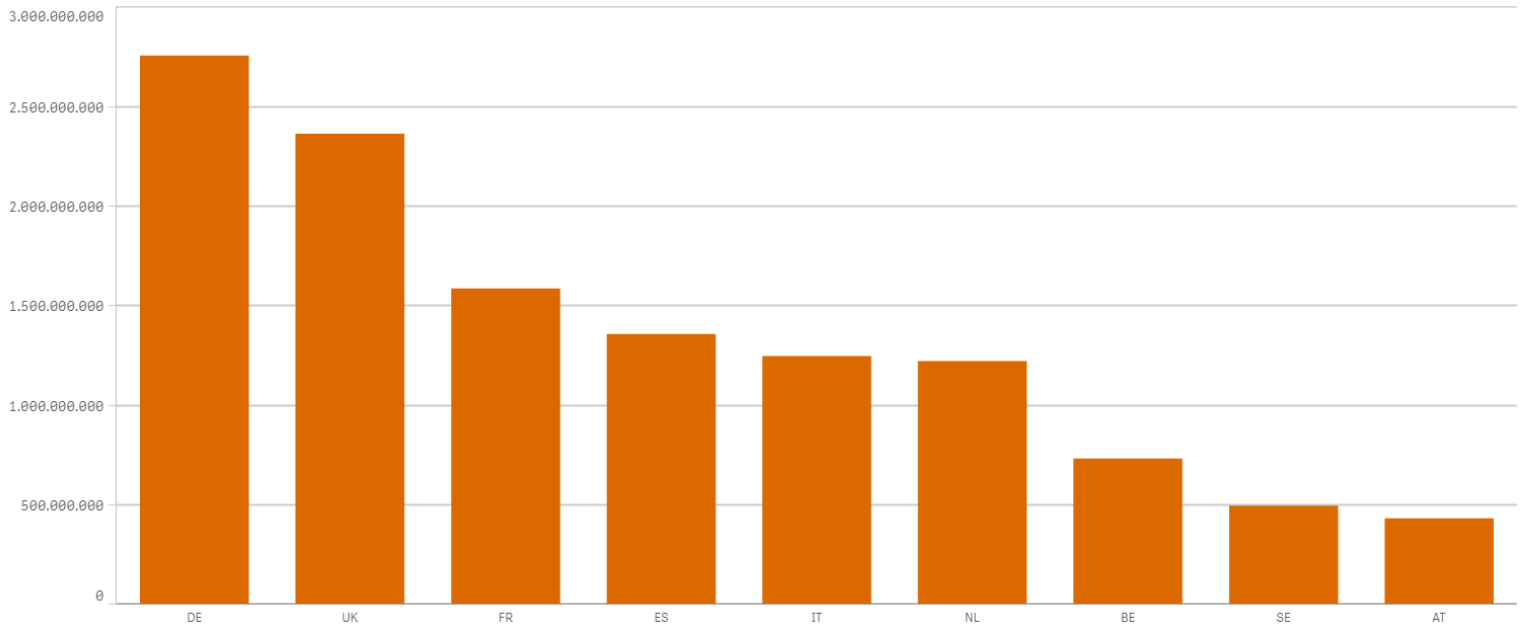
Qlik Sense® provides a diverse set of visualisation types to display data according to the needs of each circumstance.



Qlik Sense® basics
Visualisations

Bar chart

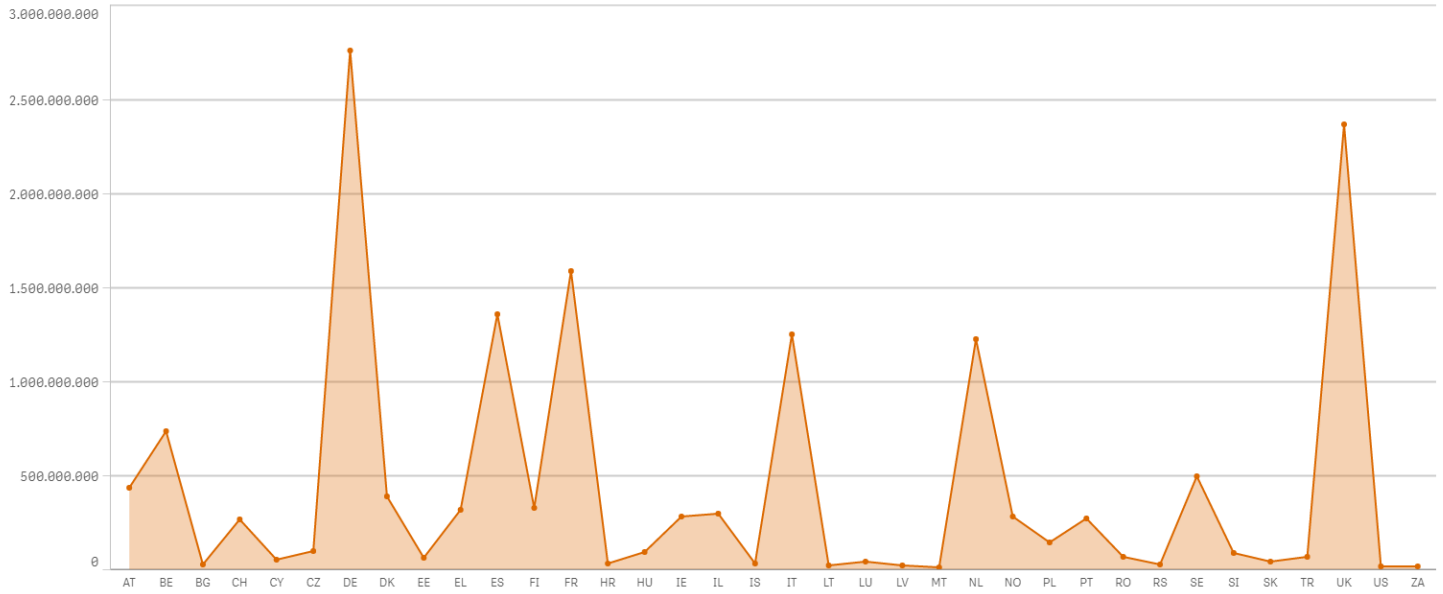
- It is used to compare items and data over time.
- Grouping and stacking bars makes it easy to visualize more than one measures.
- It is used to visualise the different values of a measure in different categories.



Qlik Sense® basics
Visualisations

Line chart

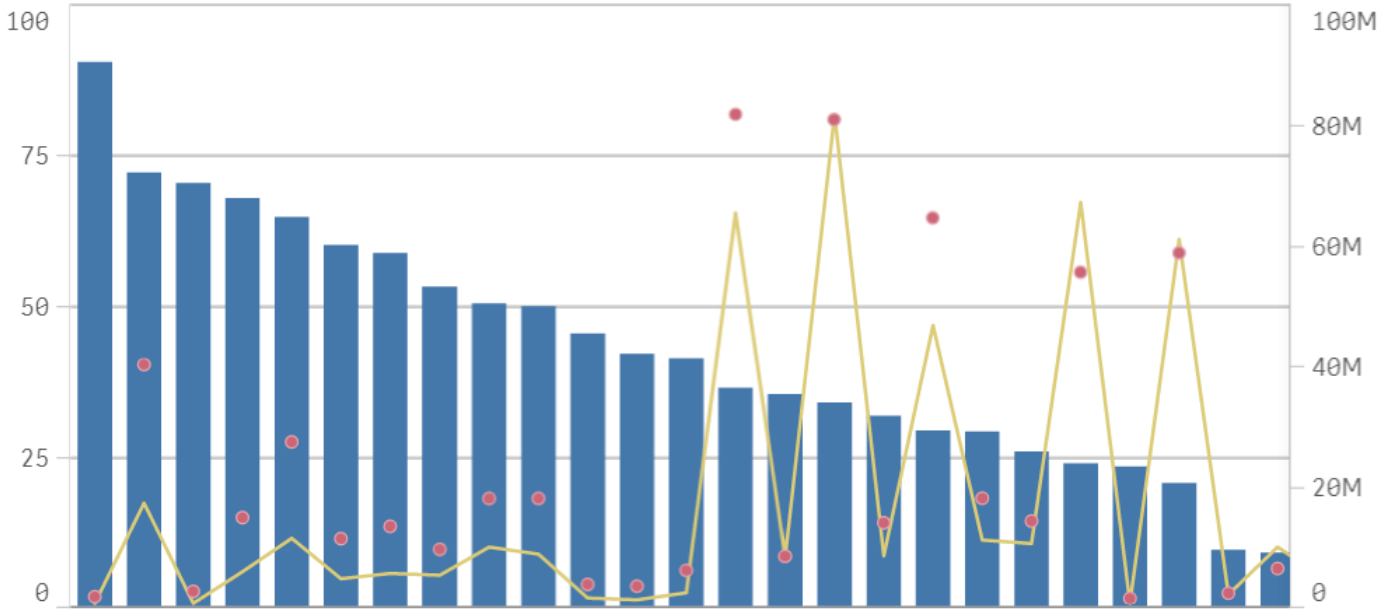
- It is used to display trends and compare changes over time. It is best used when the horizontal dimension is evenly spaced, such as the case with months, quarters, or fiscal years.



Qlik Sense® basics
Visualisations

Combo chart

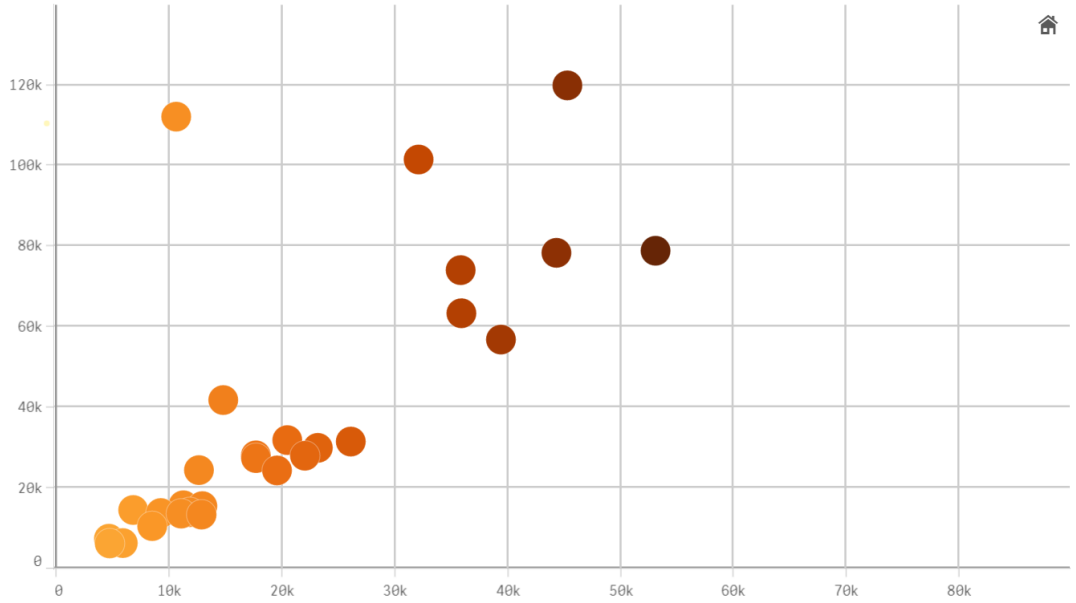
- It combines absolute and relative values by combining features of the bar chart and the line chart.
- You can use bars and lines to represent different categorical groups in the same visualization.



Qlik Sense® basics
Visualisations

Scatter plot

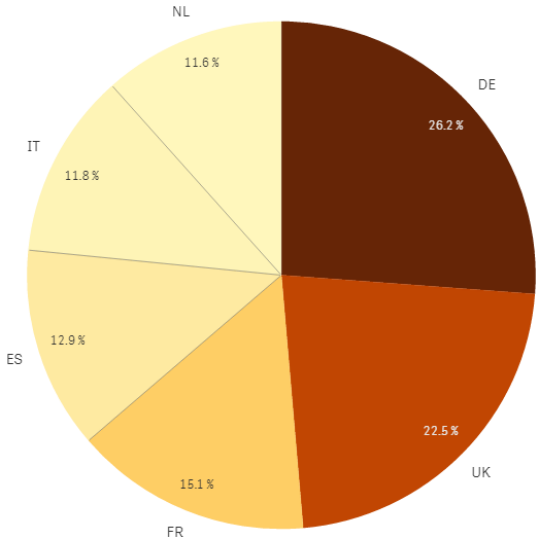
- It is best used when you are trying to display the distribution and relationship of a pair variables. The scatter plot helps detect potential relationships between values, and identify outliers in data sets.
- Additional information can be illustrated through the size and/or colour of the dots.



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

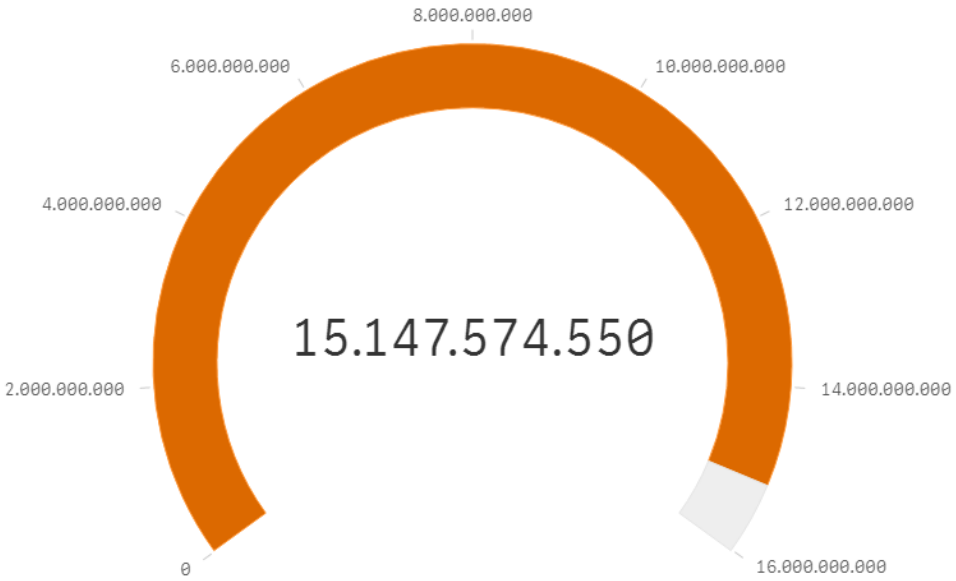
KPI – Key Performance Indicator

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

Qlik Sense® basics
Visualisations

Gauge

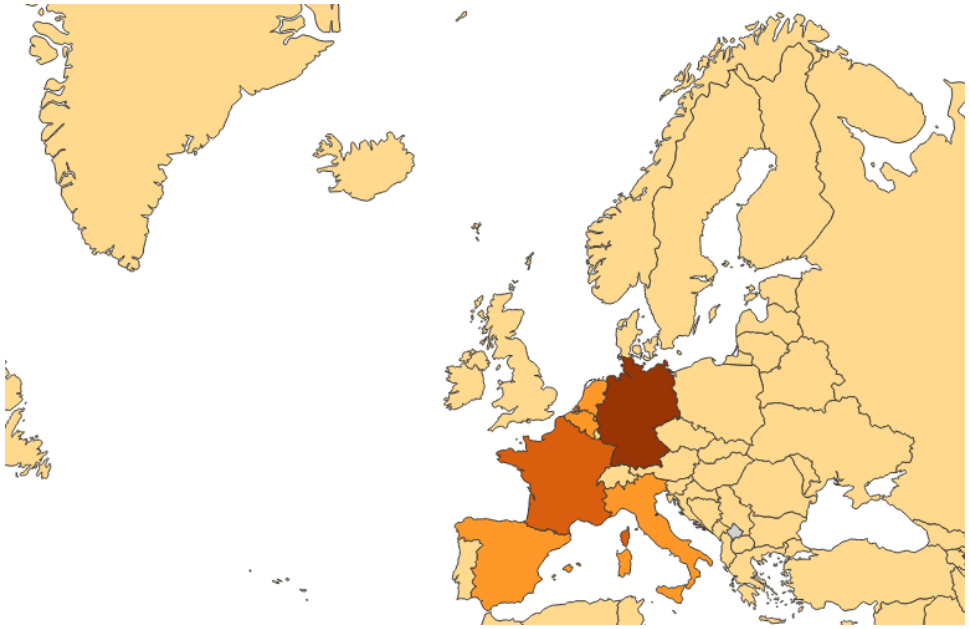
- It is used to indicate the completion of a goal.
- The gauge is often used to present KPIs, for example, on an executive dashboard, and together with segmenting and colour coding, it is an effective way of illustrating a performance result.



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.

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

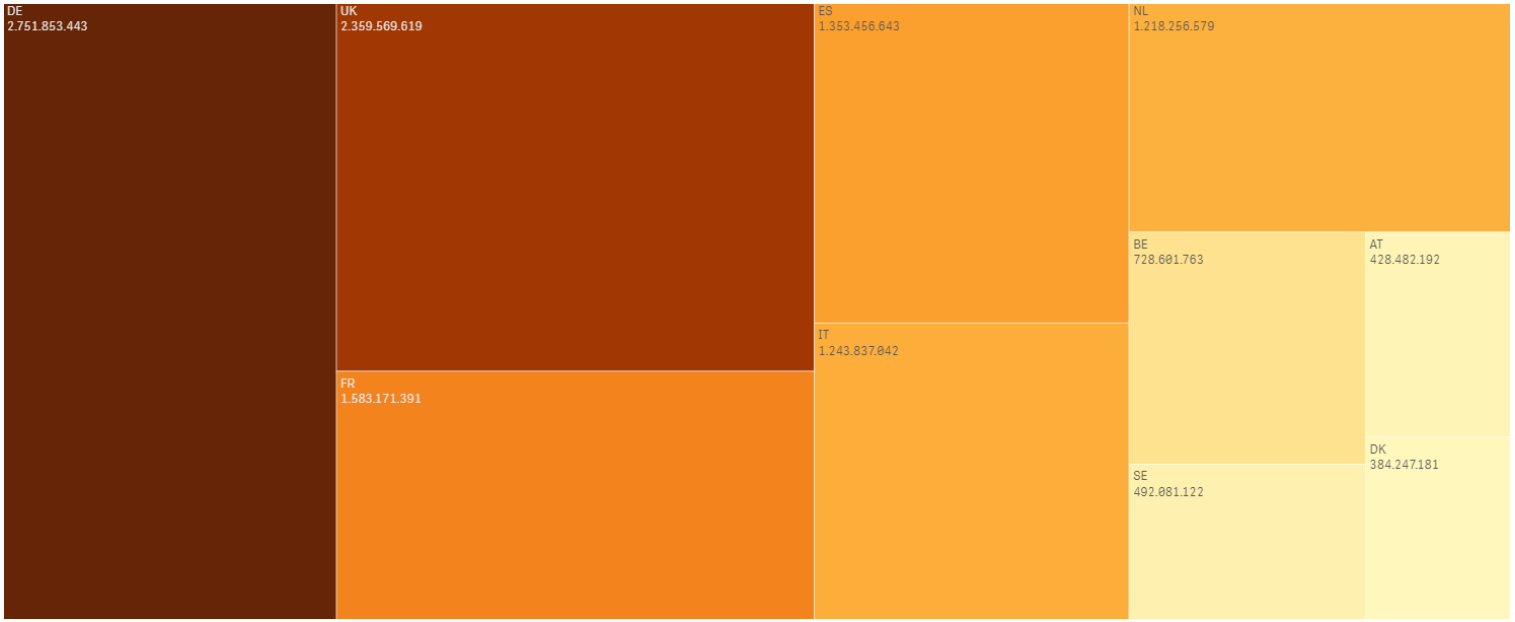
Filter pane

- 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

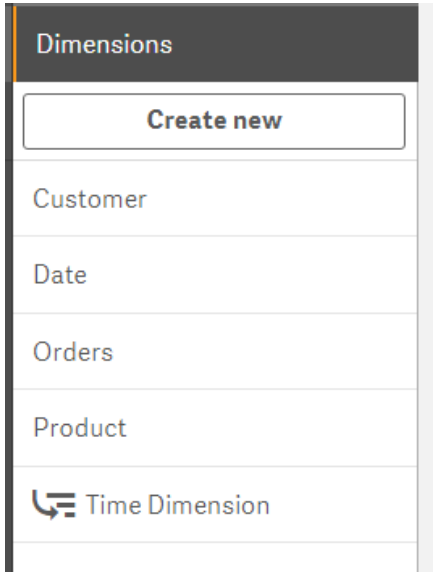
- Functions are used to manipulate data in apps. There are several hundreds available functions in Qlik Sense® that can be used for various purposes, such as to perform calculations, interpret data, determine conditions etc.
- Functions always take their parameter(s) enclosed in parentheses ( ).
- An 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.

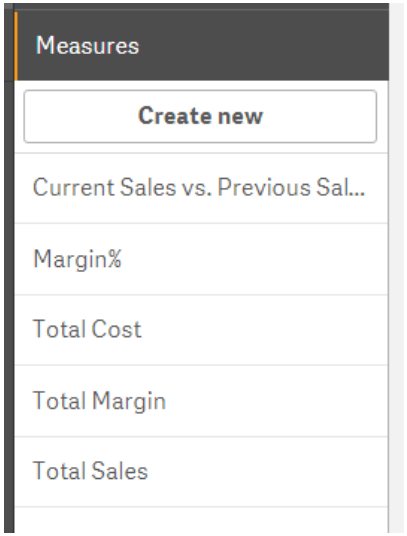
Qlik Sense® basics
Dimensions

- 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 minimum value of the field for each value of the dimension.

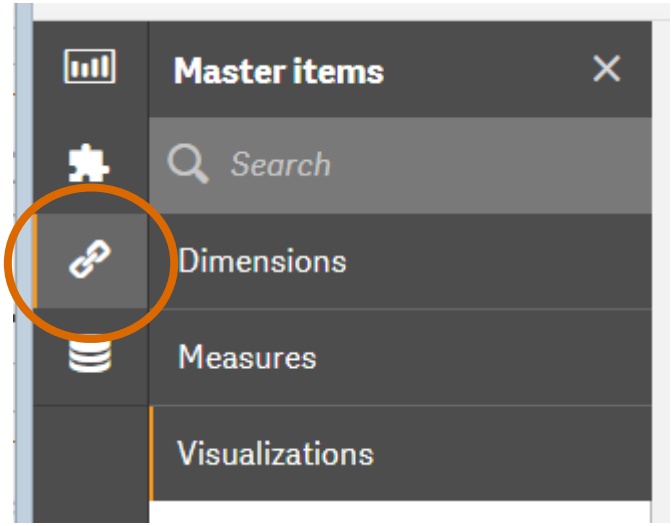


- Additionally custom measures can also be created and are a major part of any Qlik project.

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

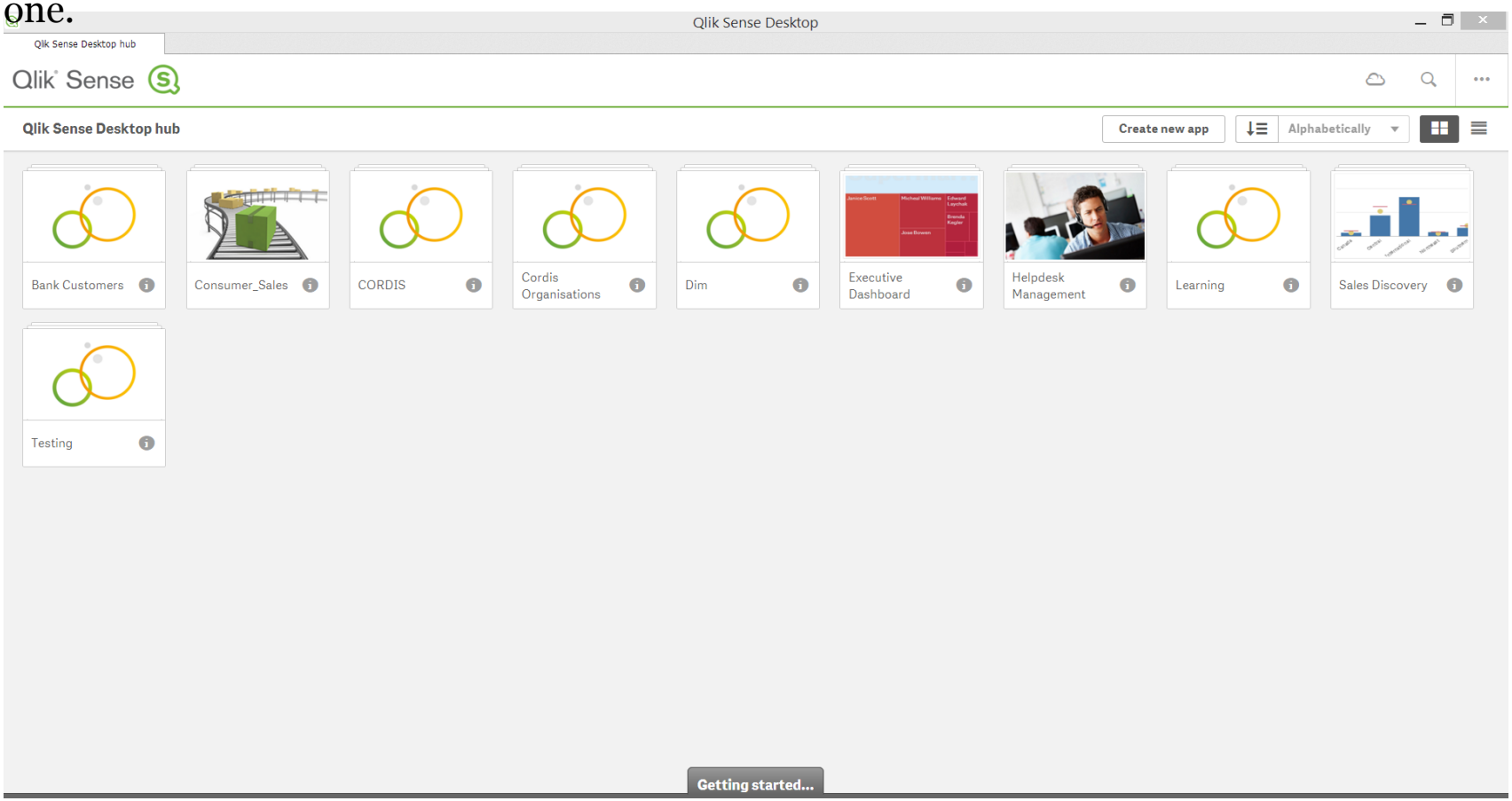
- **Tip!** When searching google, check out results for Qlik View. Often the answer will also be applicable in Qlik Sense®.

Qlik Sense® user interface

Qlik Sense® user interface

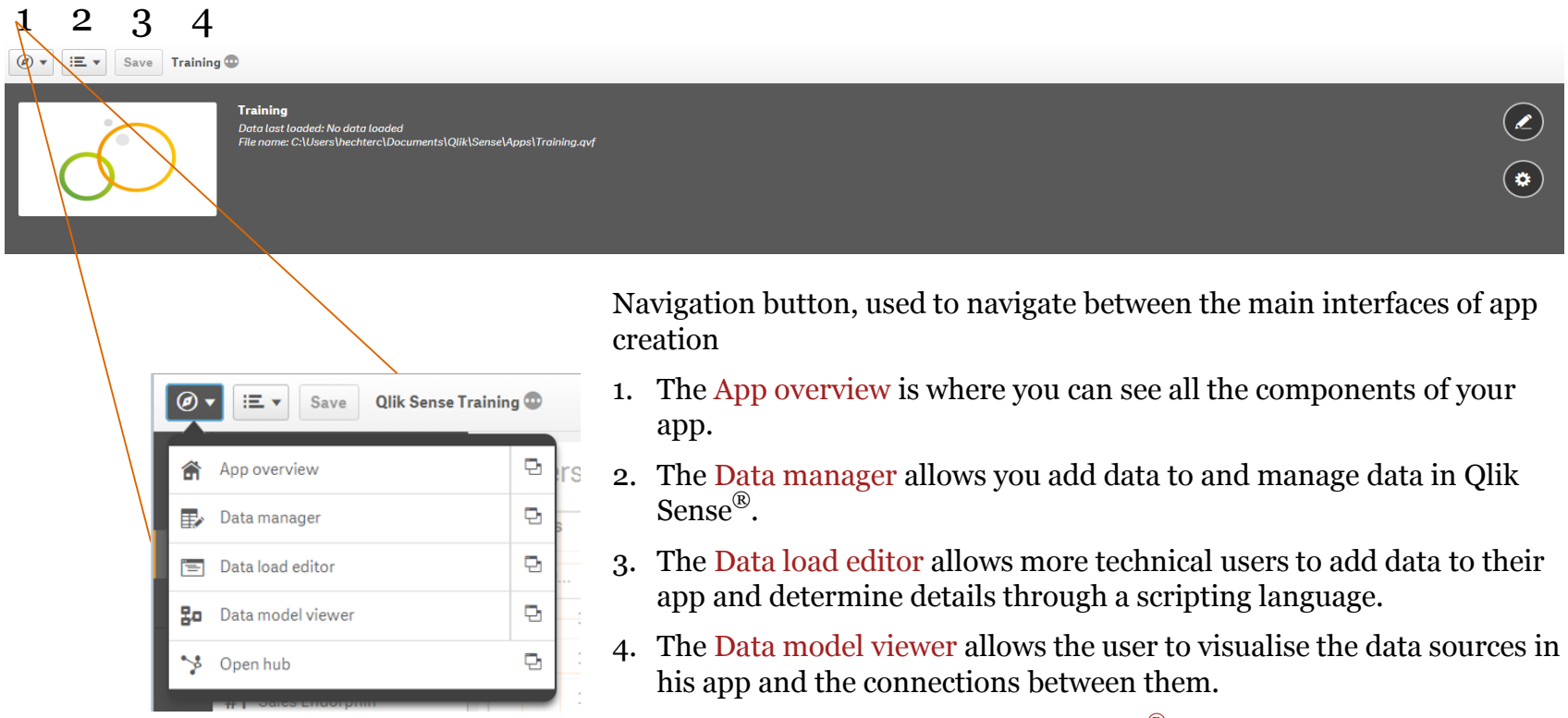
Qlik Sense® Hub

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



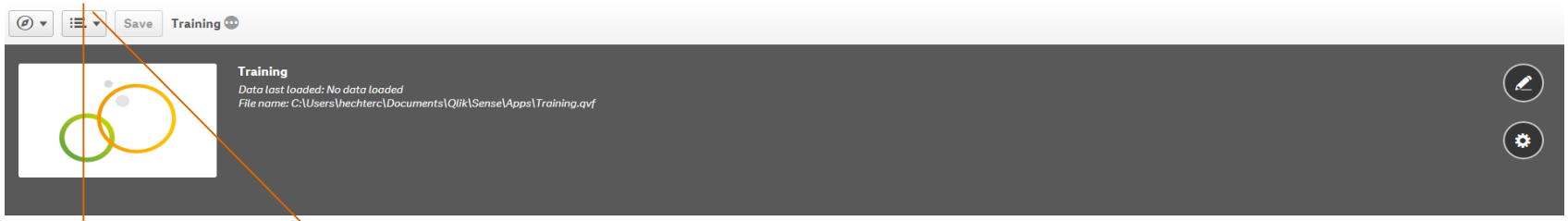
Navigation button, used to navigate between the main interfaces of app creation

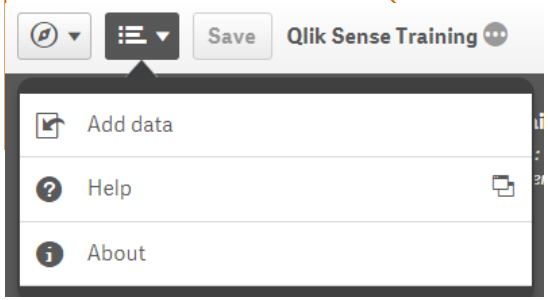
1. The App overview is where you can see all the components of your app.
2. The Data manager allows you add data to and manage data in Qlik Sense®.
3. The Data load editor allows more technical users to add data to their app and determine details through a scripting language.
4. The Data model viewer 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.

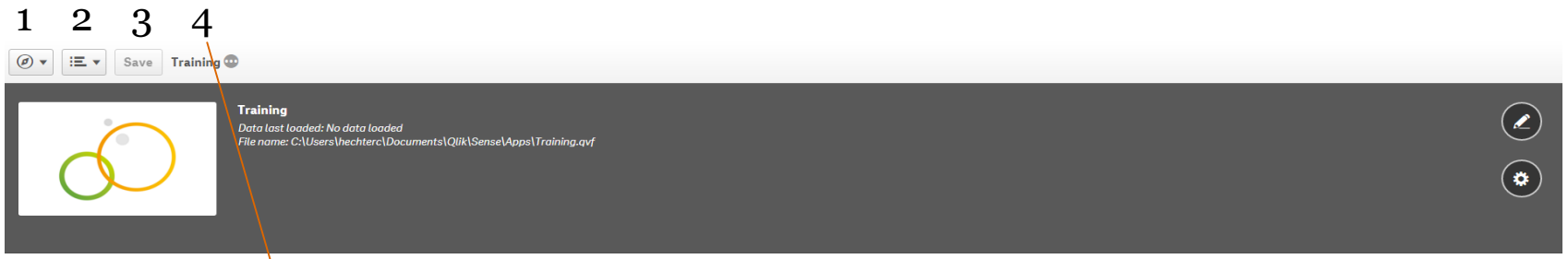
Qlik Sense® user interface

App overview

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

Qlik Sense® user interface

App overview

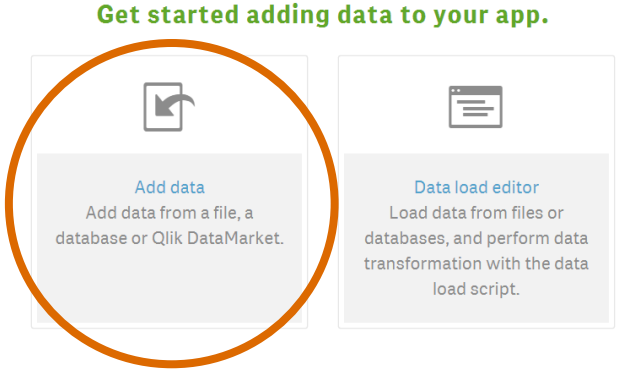


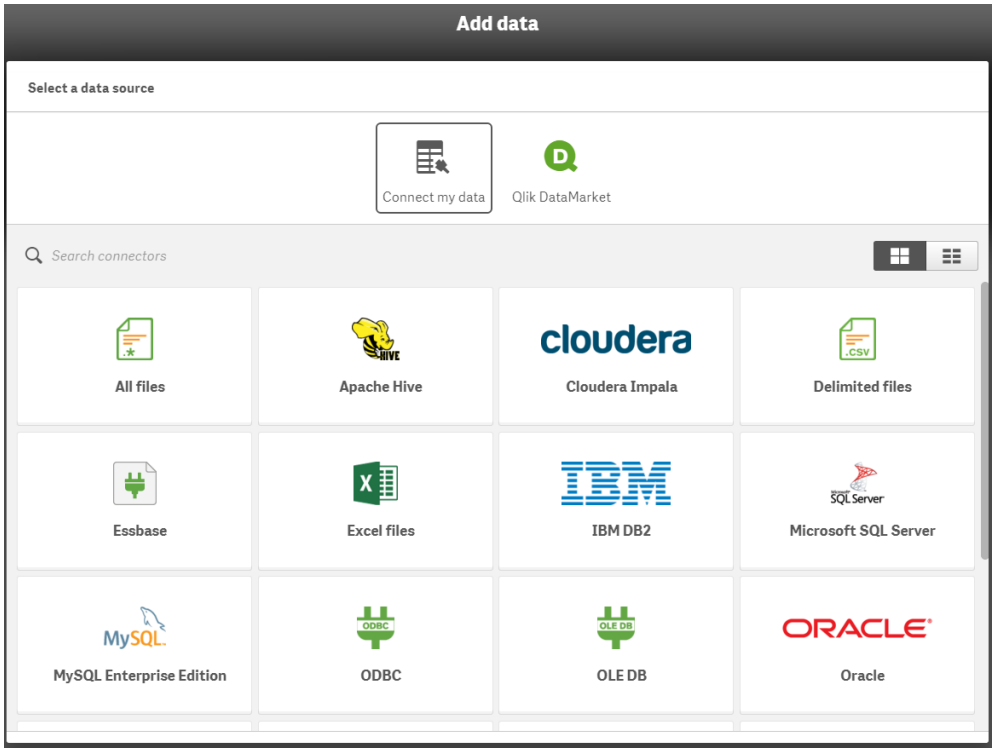
The three dots toggle the grey area, either collapsing or expanding it.
"Show app information"

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.

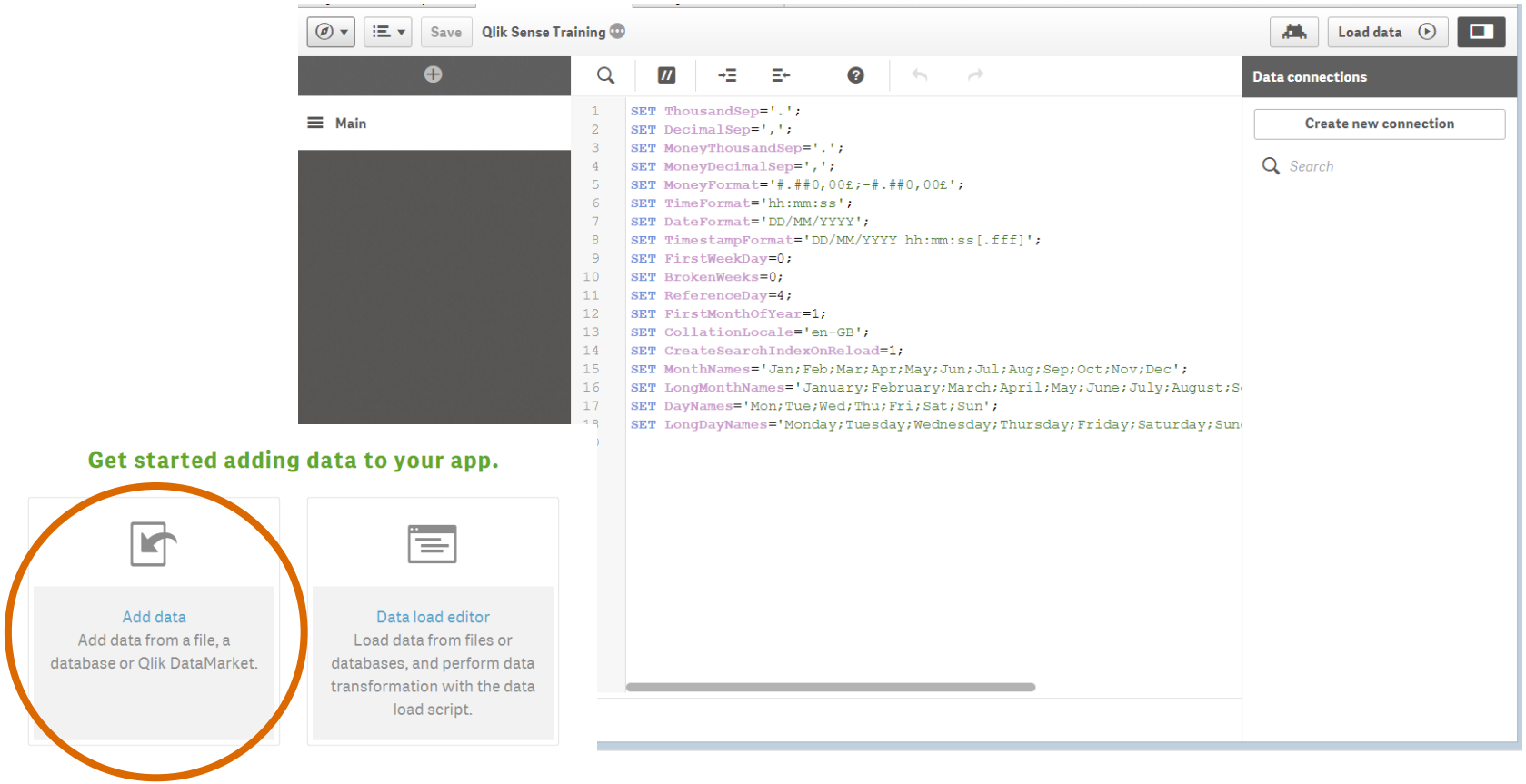
- Text files (CSV or TSV files).
- HTML tables.
- Excel files
- XML files.
- Qlik native QVD and QVX files.





Qlik Sense® user interface
Data addition menu

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

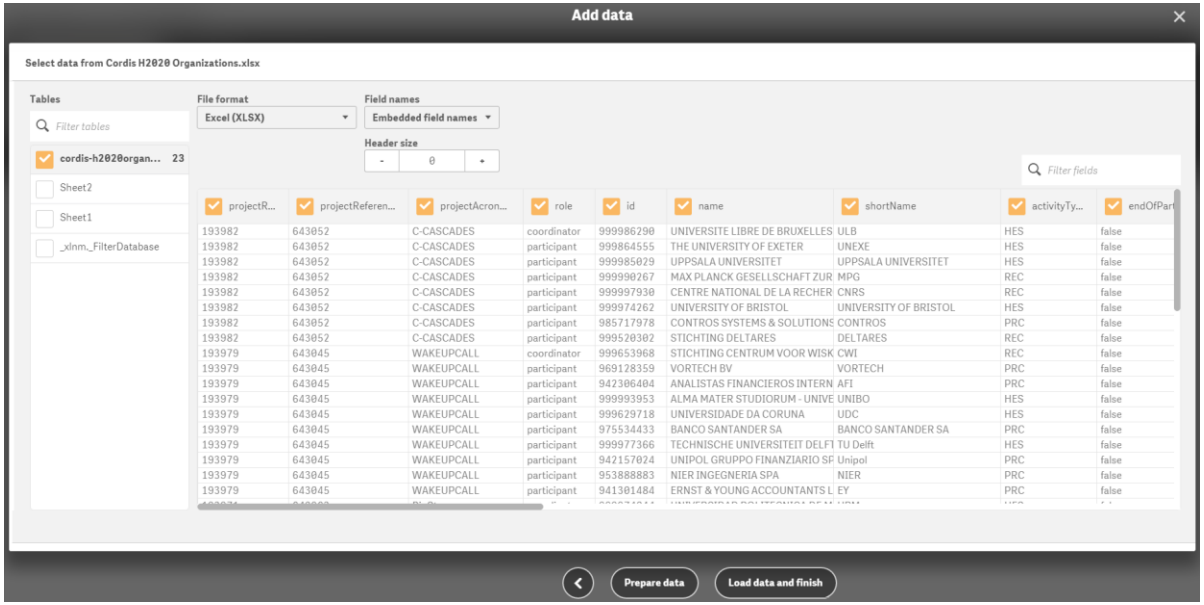


Qlik Sense® user interface

Data preparation menu

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

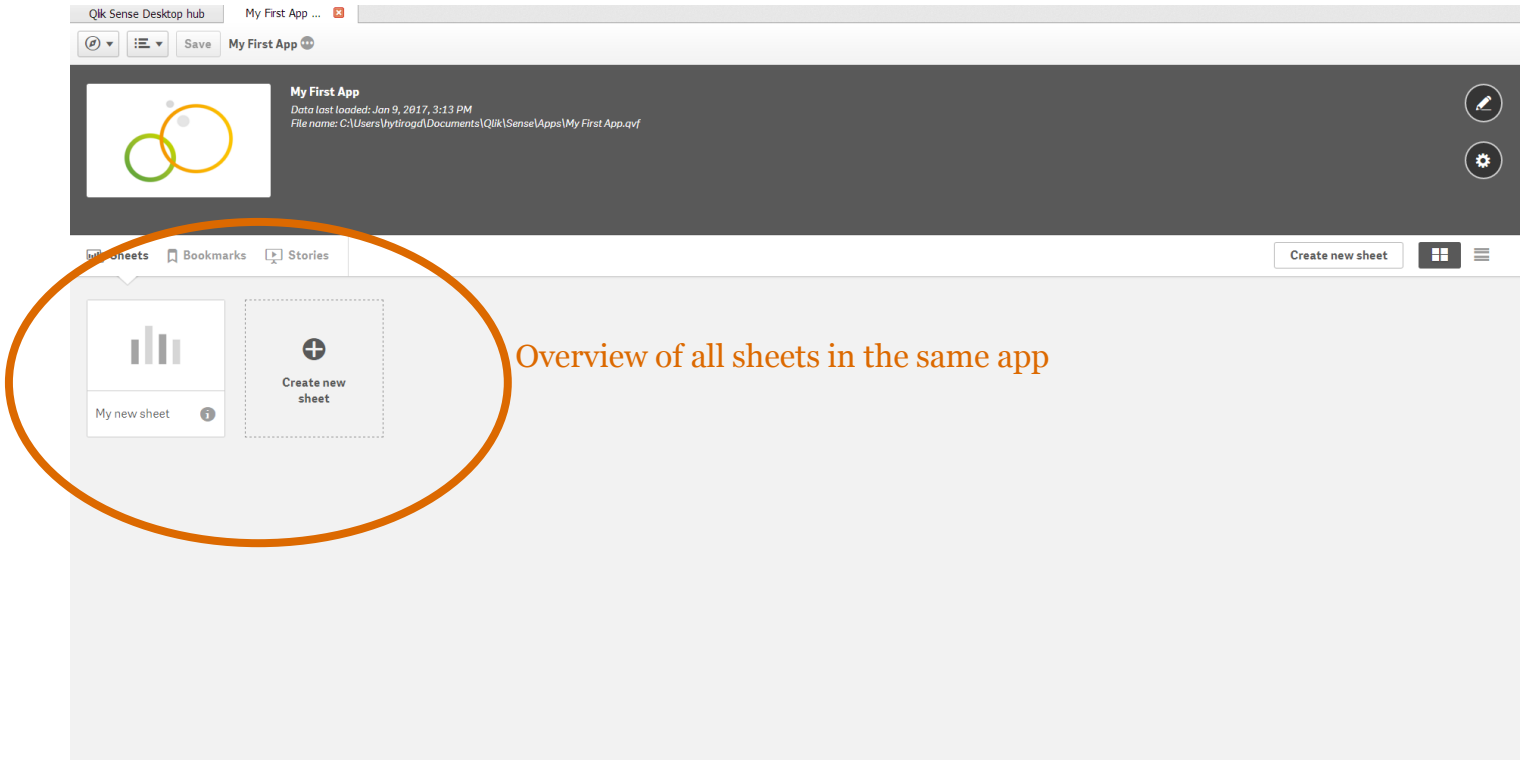
- We can select the columns we need and remove the rest for faster data loading and interaction times;
- We can rename the columns to more readable or useful labels;
- Finally we can determine the types of the fields imported for optimal analysis.



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.

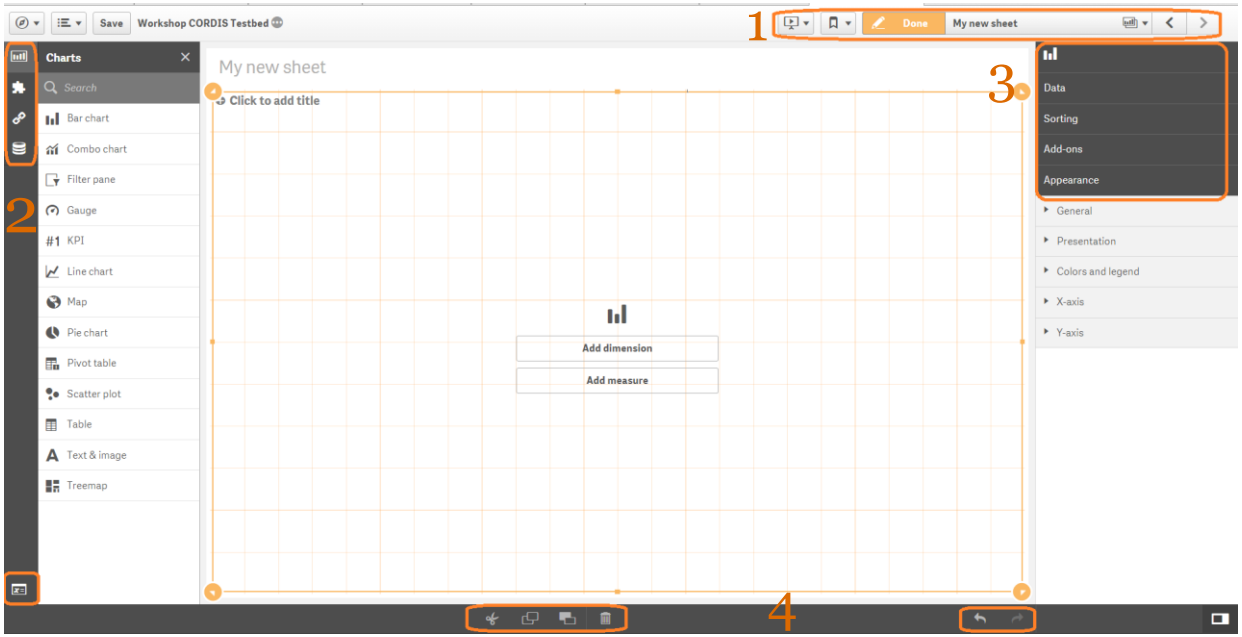


Qlik Sense® user interface

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.

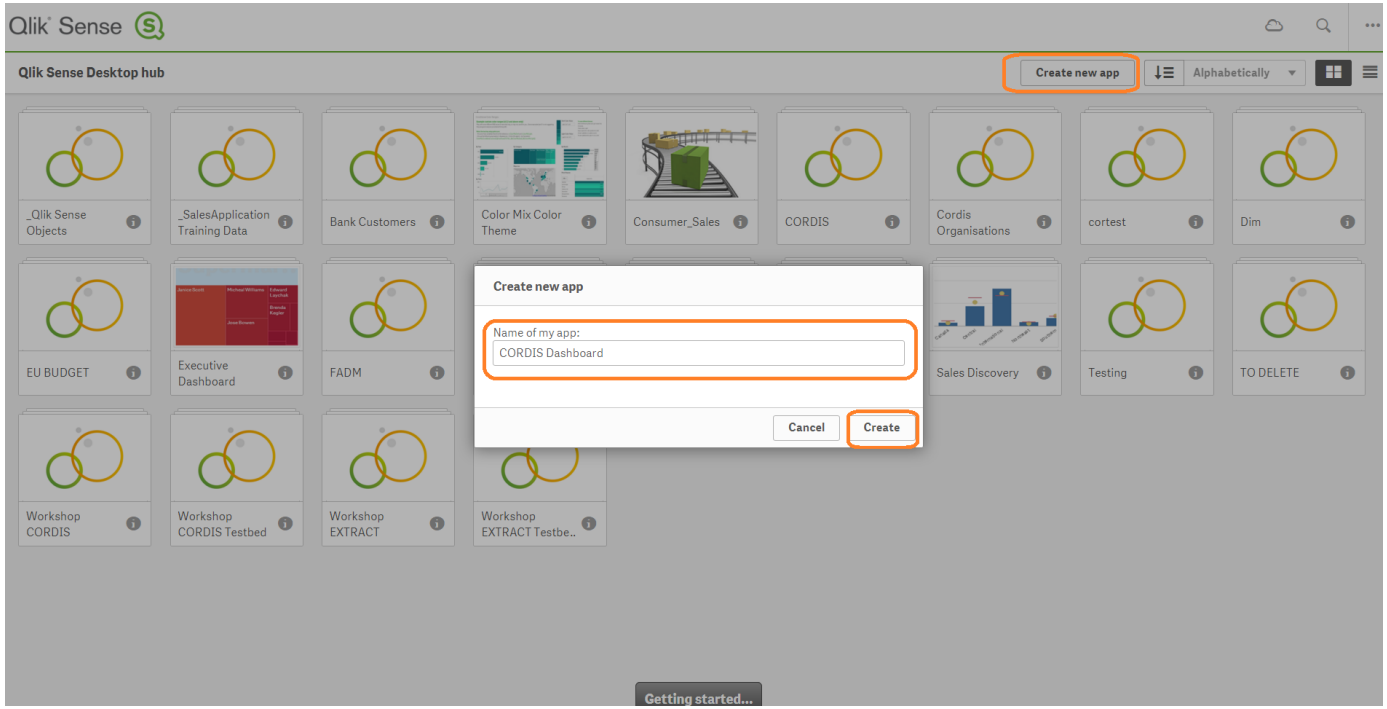
Instructions

- 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

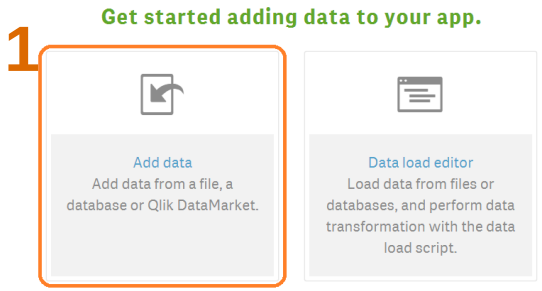
Adding our data

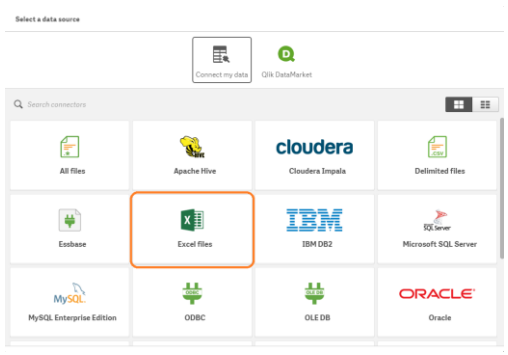
Upon opening your empty app you are prompted to add data to it.

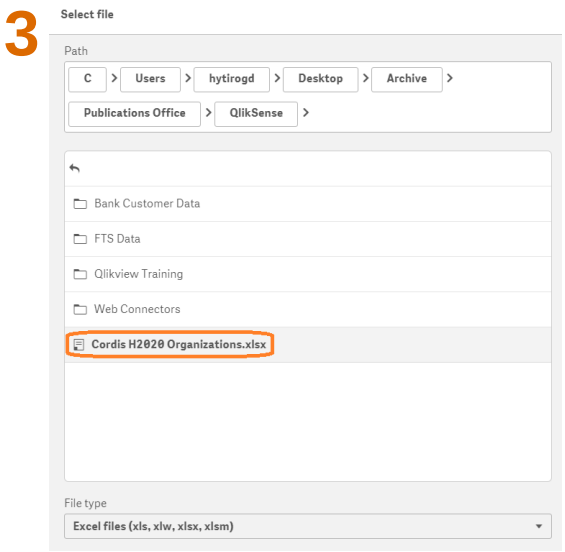
Select "Add data"

From the next menu choose "Excel files"

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



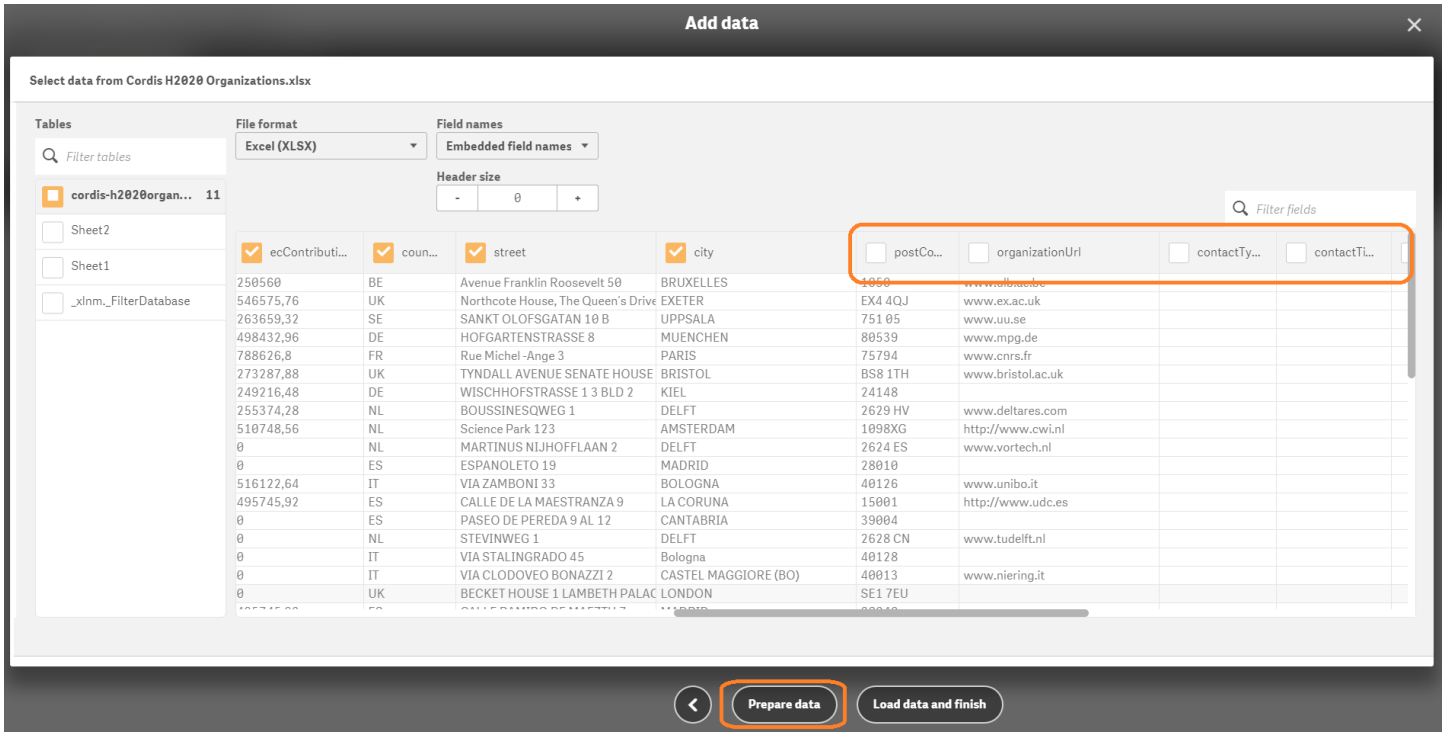




Hands on exercise
Visualising CORDIS Data

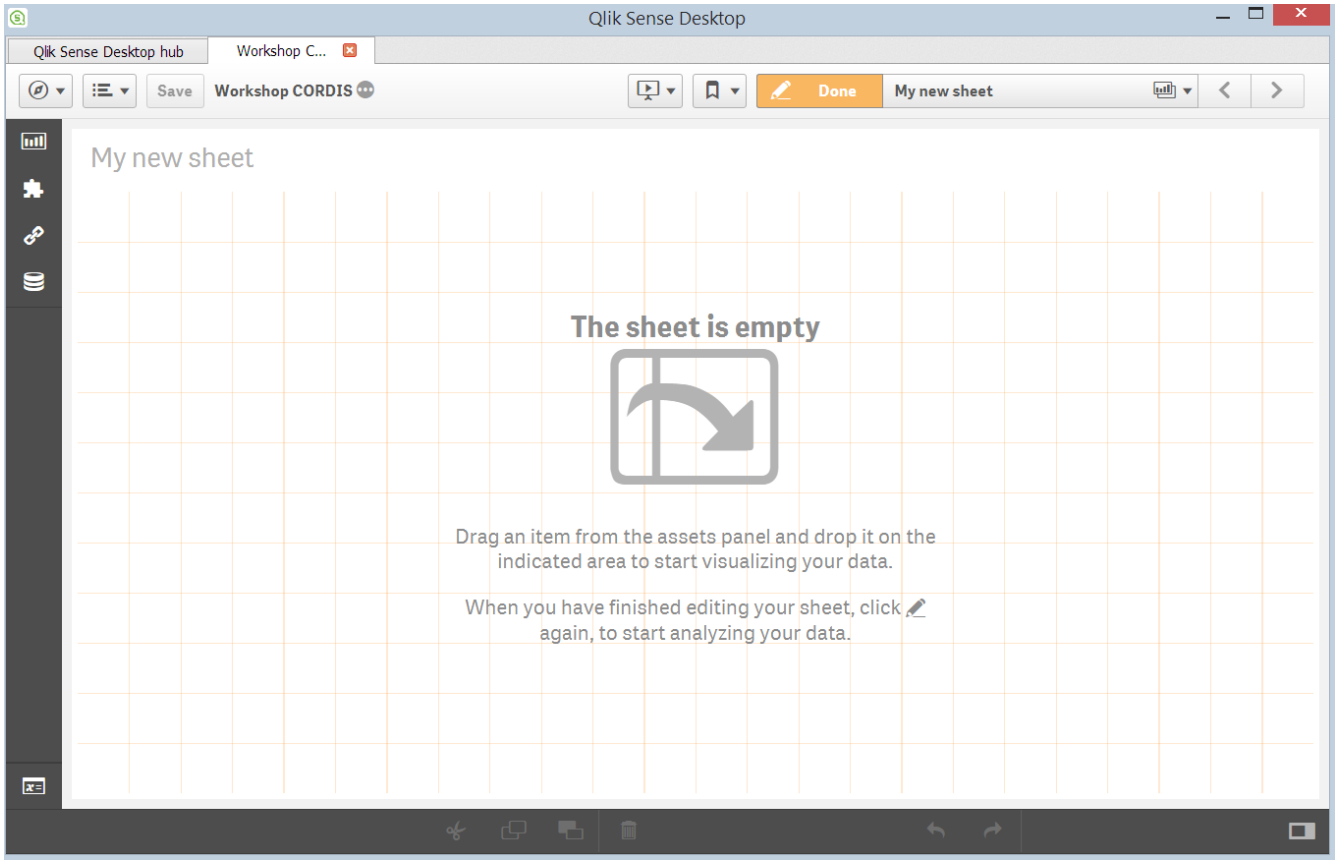
Preparing our data

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



Hands on exercise
Visualising CORDIS Data

Our First Sheet

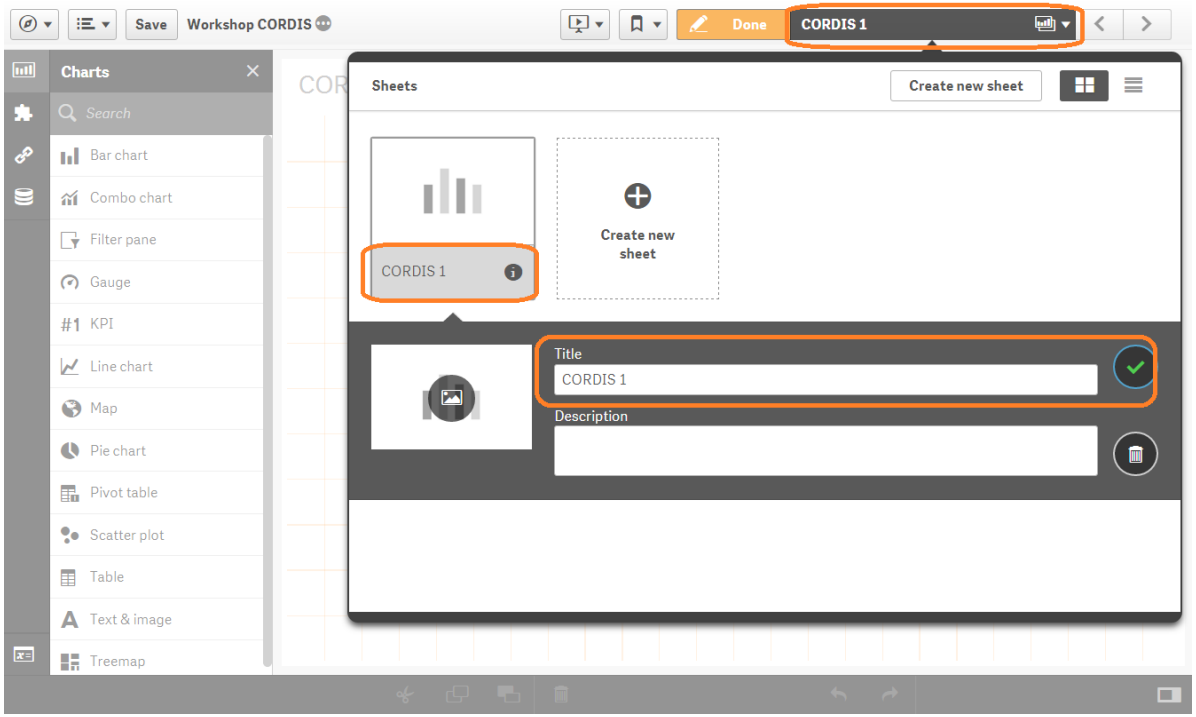


Hands on exercise
Visualising CORDIS Data

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.

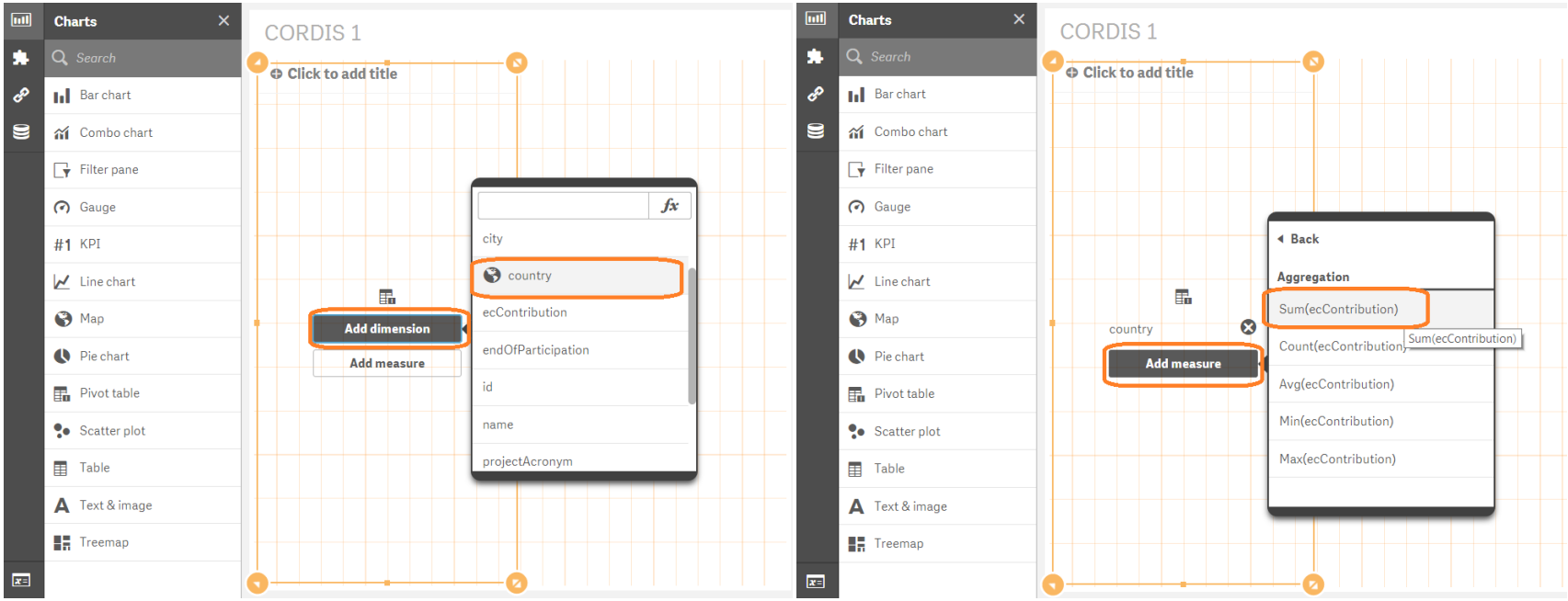
Notice that when doing so you can move it around to preview the position it will take on your sheet.

Hands on exercise
Visualising CORDIS Data

Adding a Pivot Table

Add the dimension "country"

Add the measure "Sum(ecContribution)"

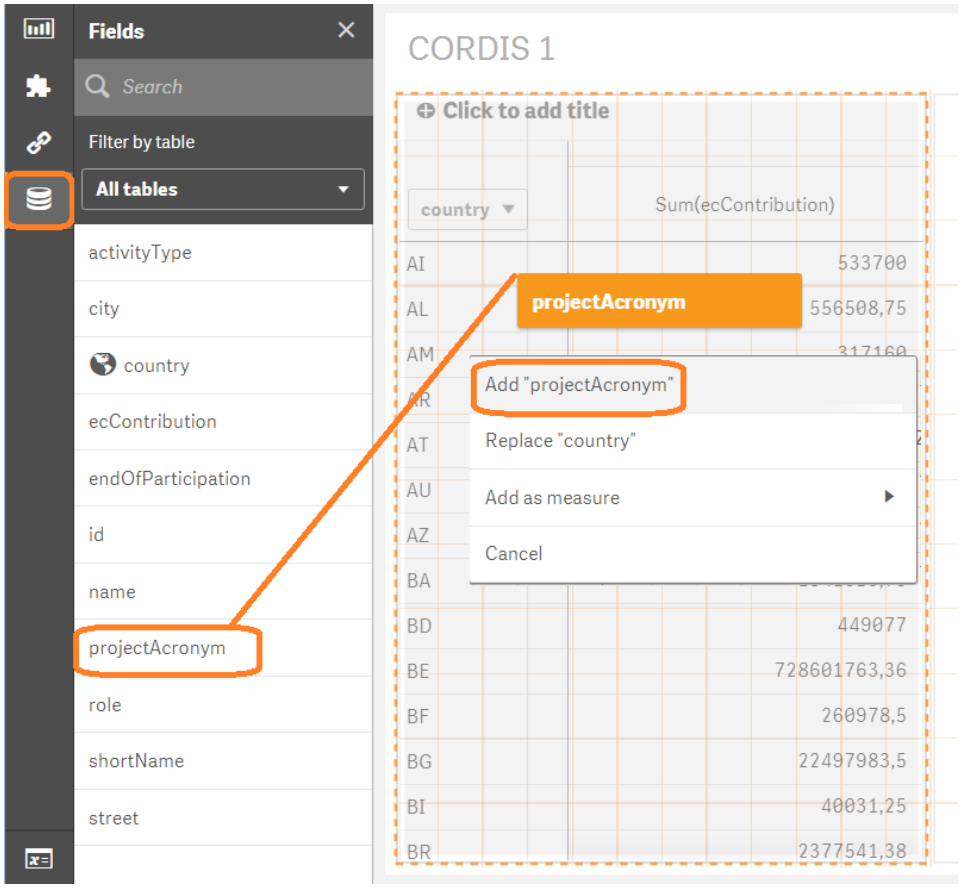


Hands on exercise
Visualising CORDIS Data

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.



Hands on exercise
Visualising CORDIS Data

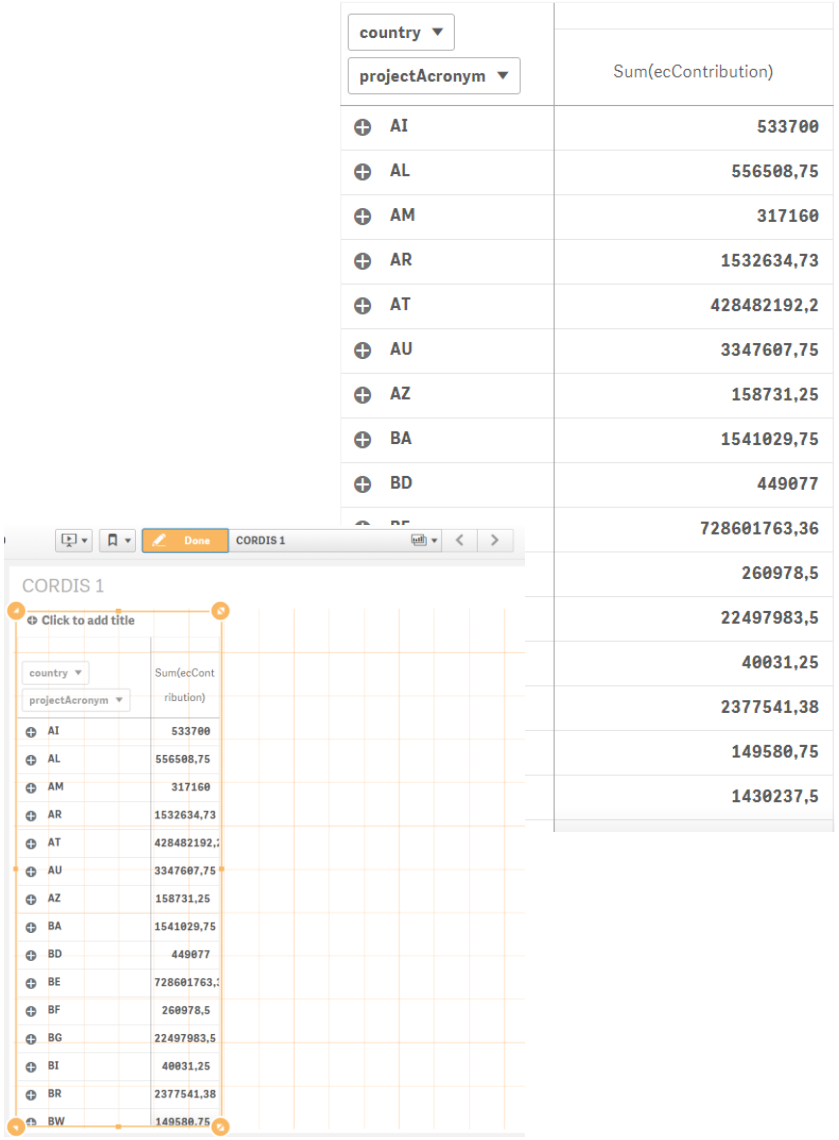
Adding a Pivot Table

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"

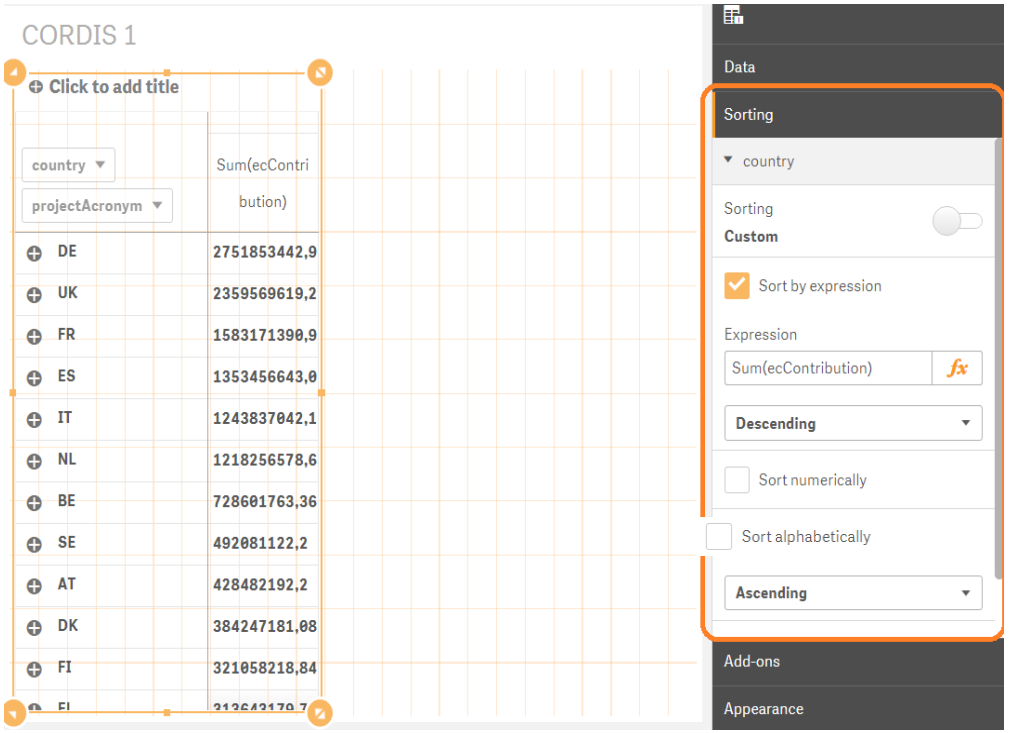


Hands on exercise
Visualising CORDIS Data

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*



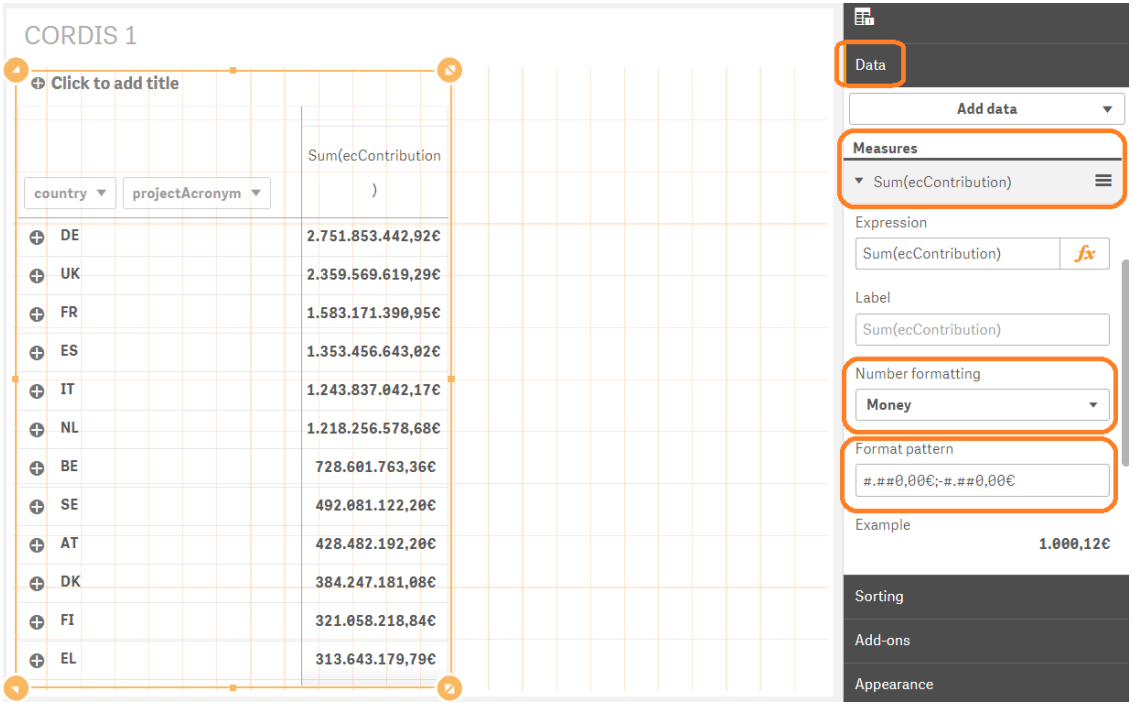
Hands on exercise
Visualising CORDIS Data

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"



Hands on exercise
Visualising CORDIS Data

Adding a Pivot Table

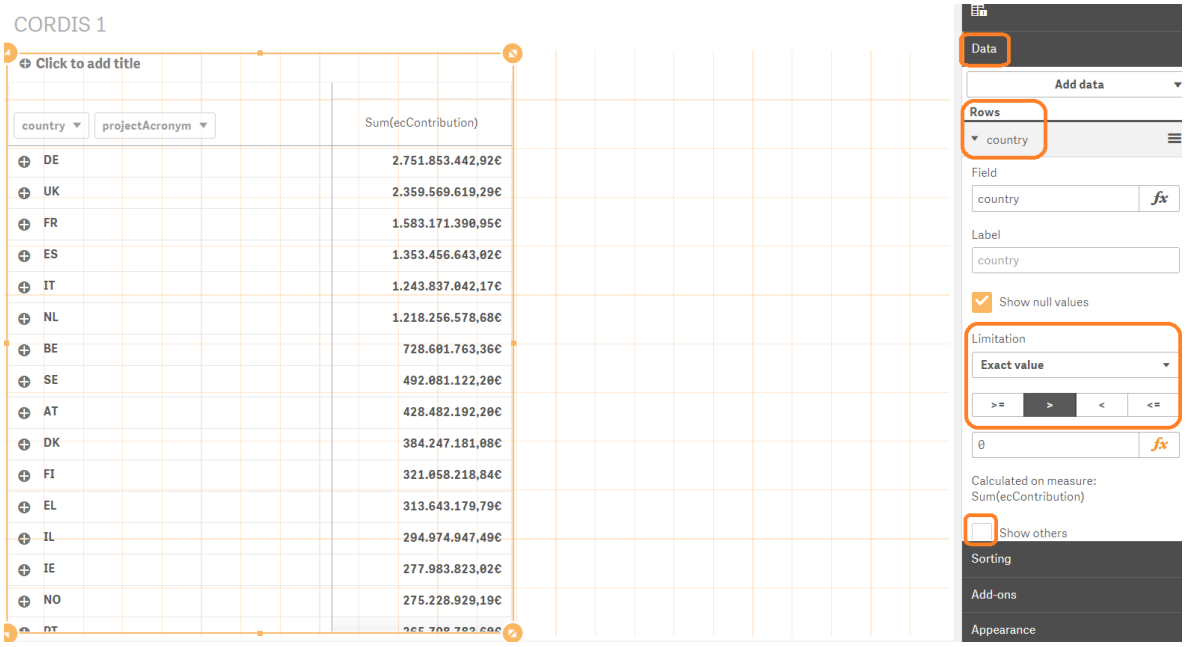
If you click on “Done” to view the pivot table and scroll through, you will notice that it also lists a number of countries that have received no contributions. We do not need those in our table.

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.

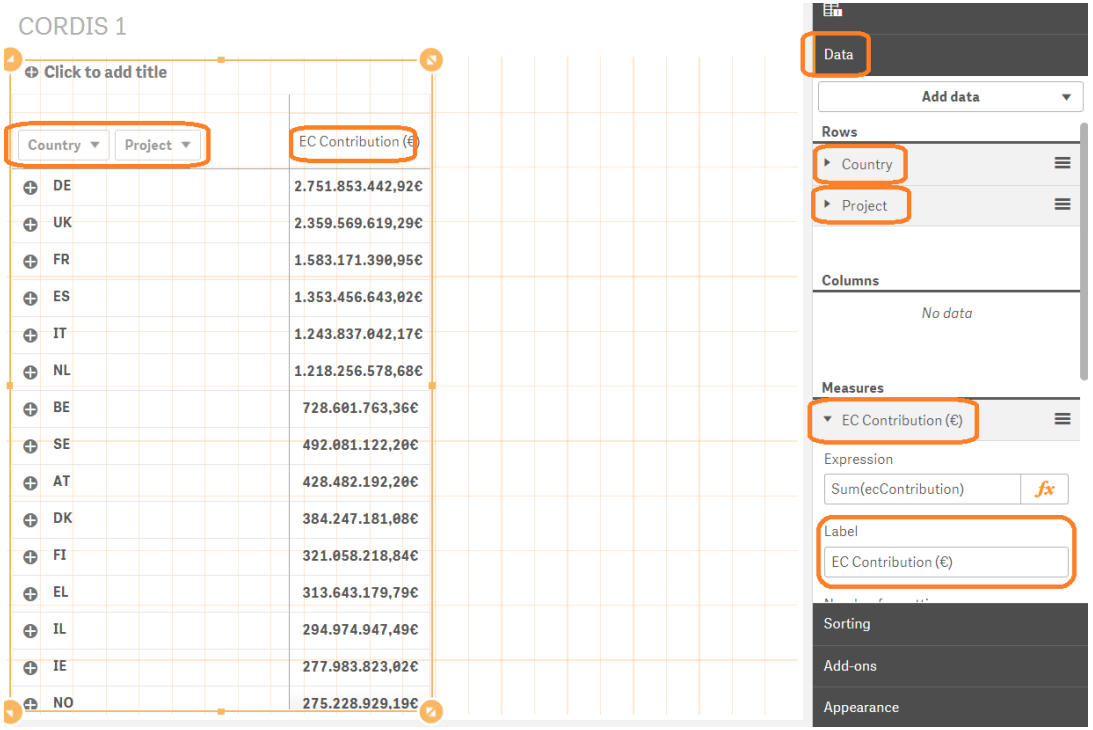


Hands on exercise
Visualising CORDIS Data

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.

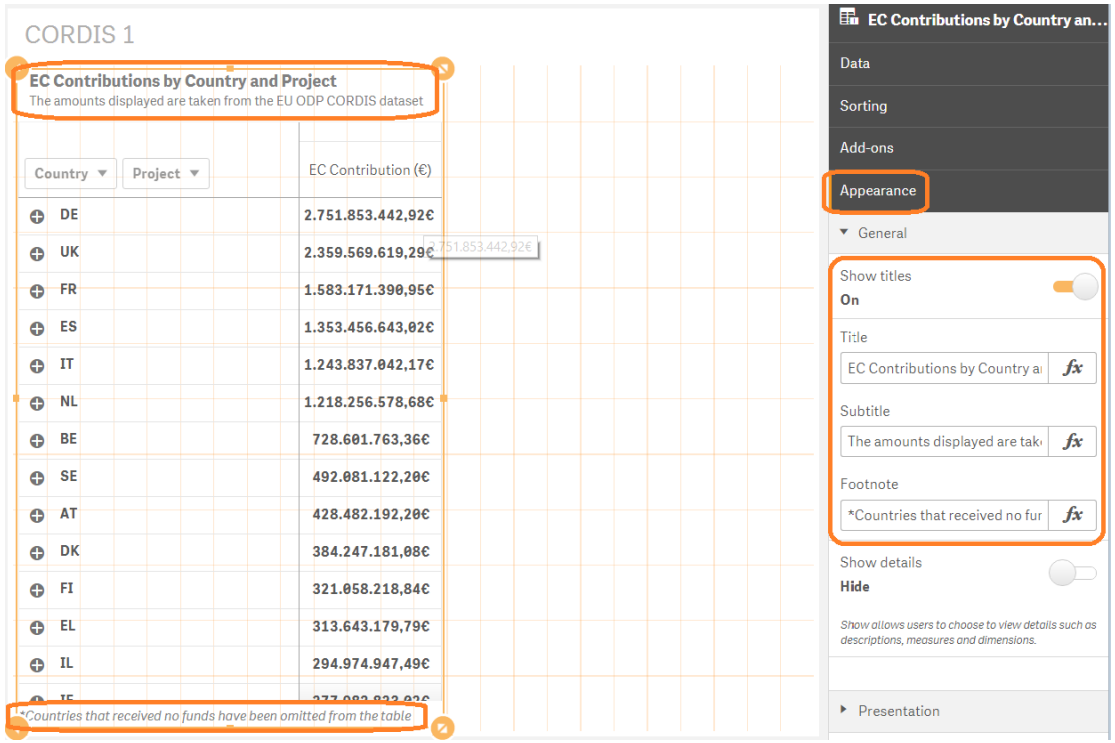


Hands on exercise
Visualising CORDIS Data

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.

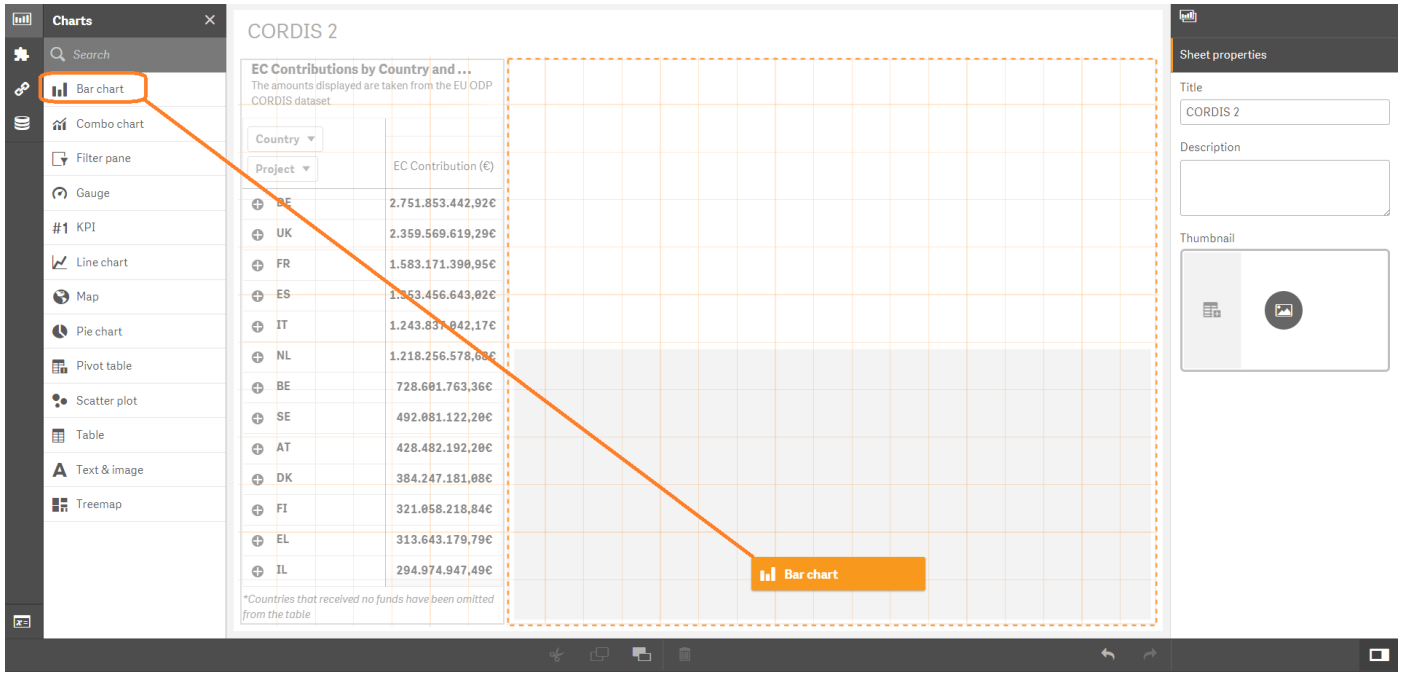
In the "Appearance" menu, under "General", add a Title, Subtitle and Legend to better describe your pivot table.



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.

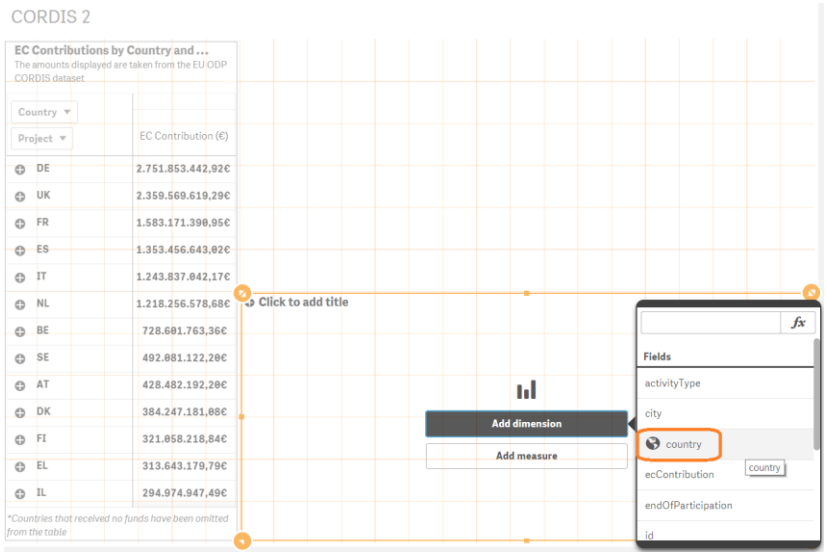


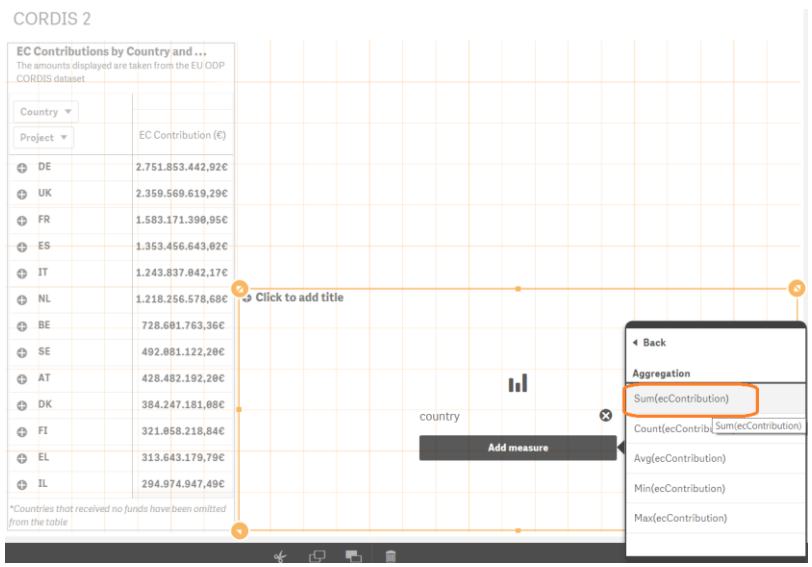
Hands on exercise
Visualising CORDIS Data

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*

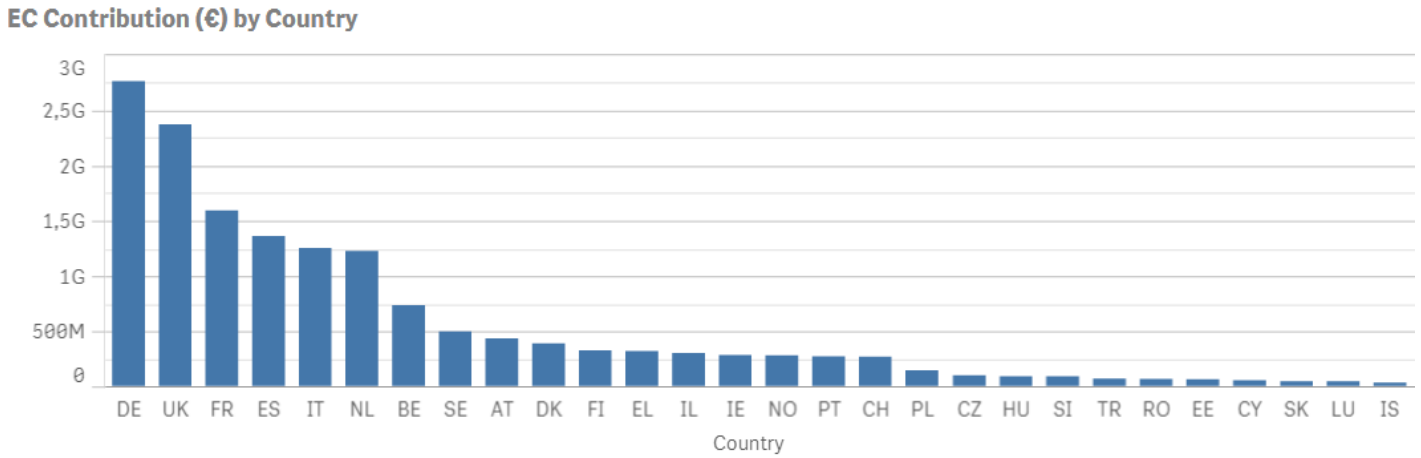
There are many ways in which you can explore your data and the more objects you add the more complex the options!

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*



Hands on exercise
Visualising CORDIS Data

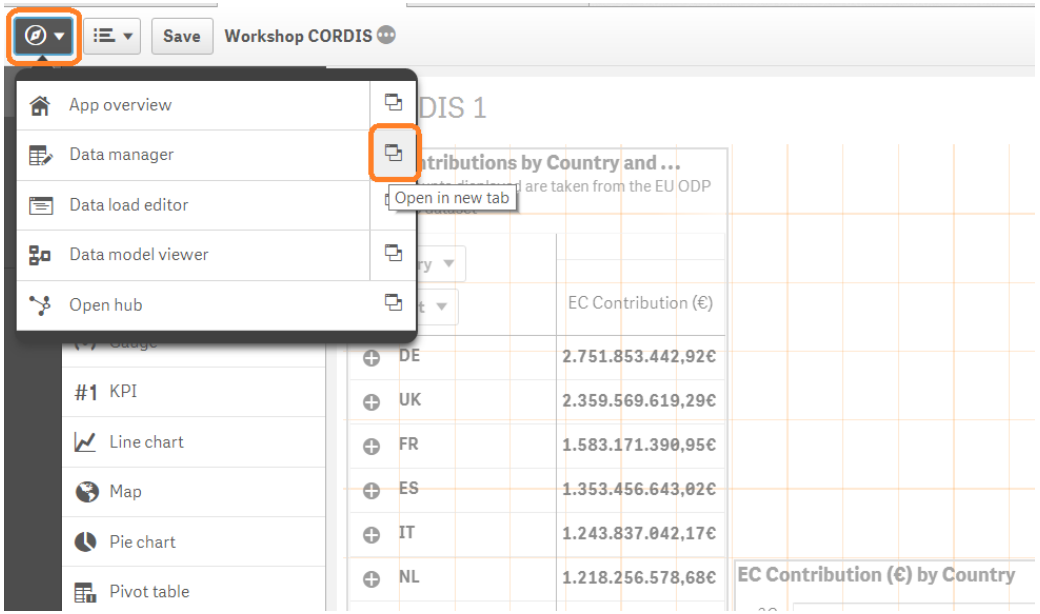
Adding a Map

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.



Hands on exercise
Visualising CORDIS Data

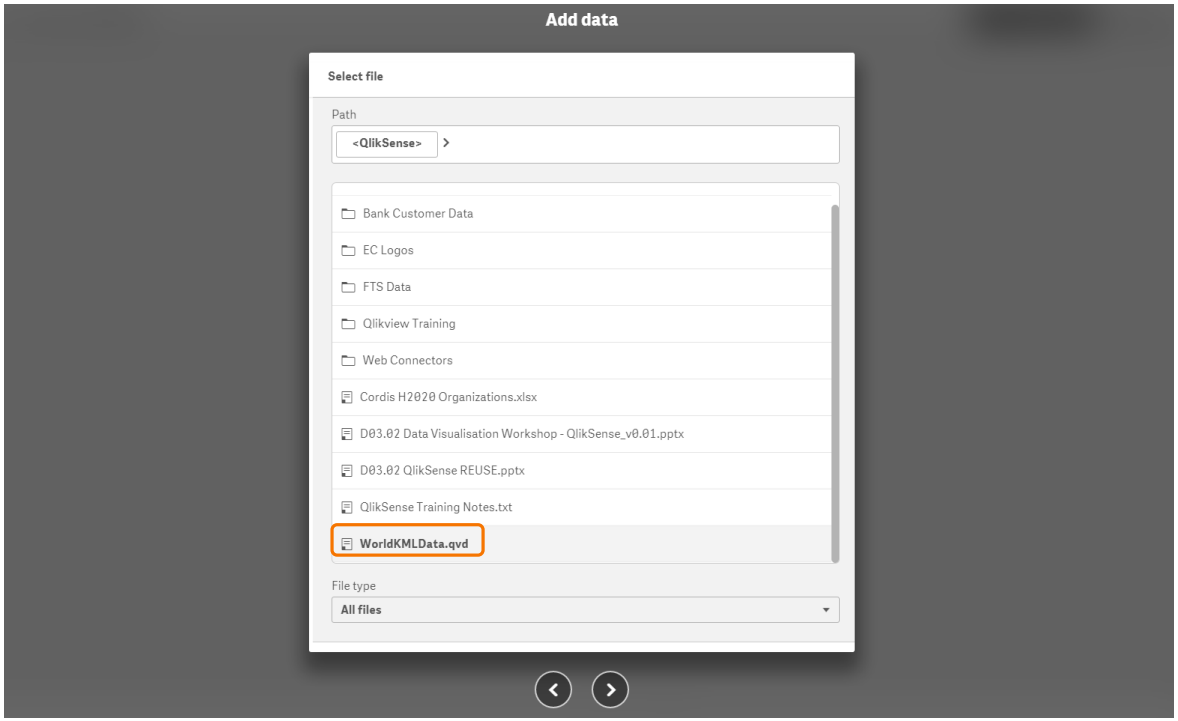
Adding a Map

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.

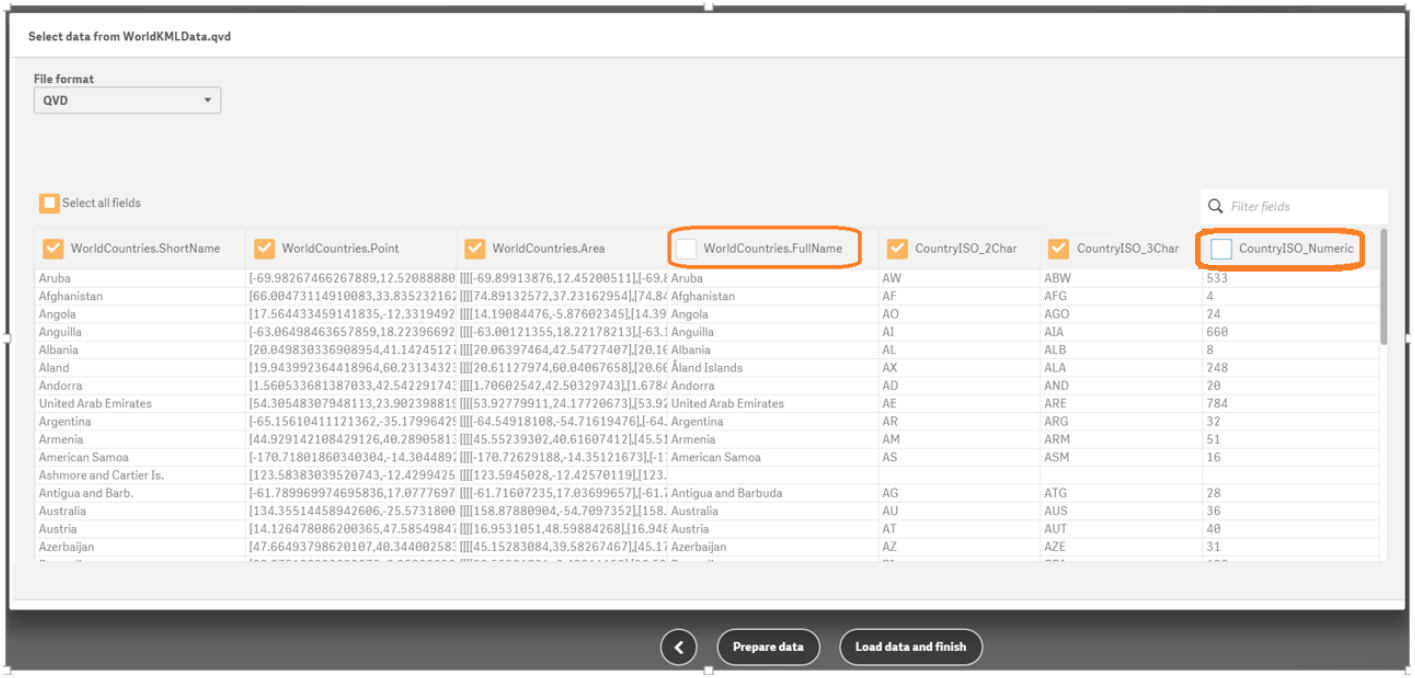


Hands on exercise
Visualising CORDIS Data

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".



Hands on exercise
Visualising CORDIS Data

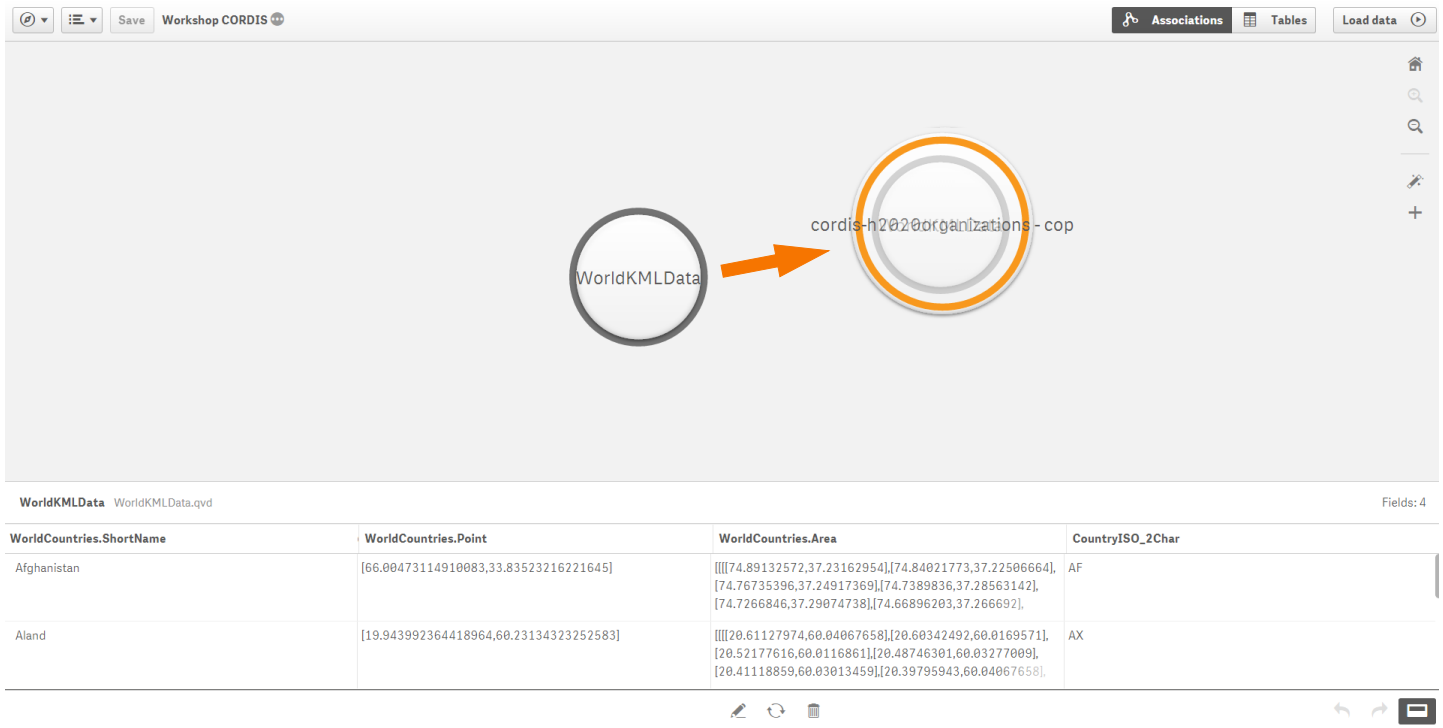
Adding a Map

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.

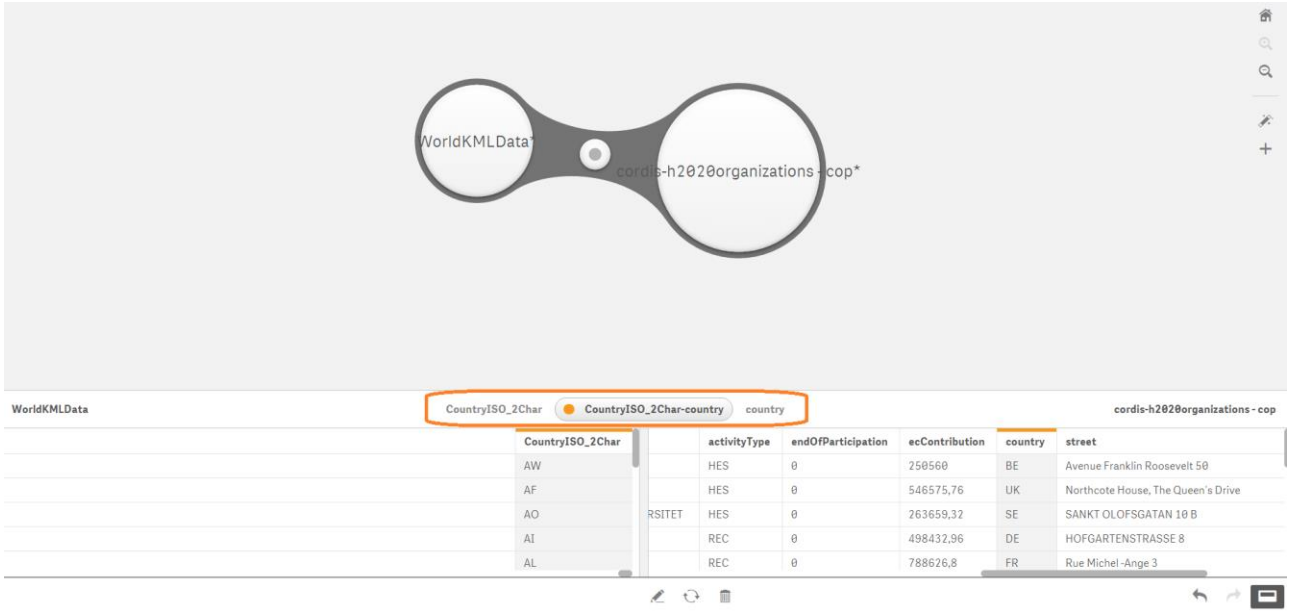


Hands on exercise
Visualising CORDIS Data

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.

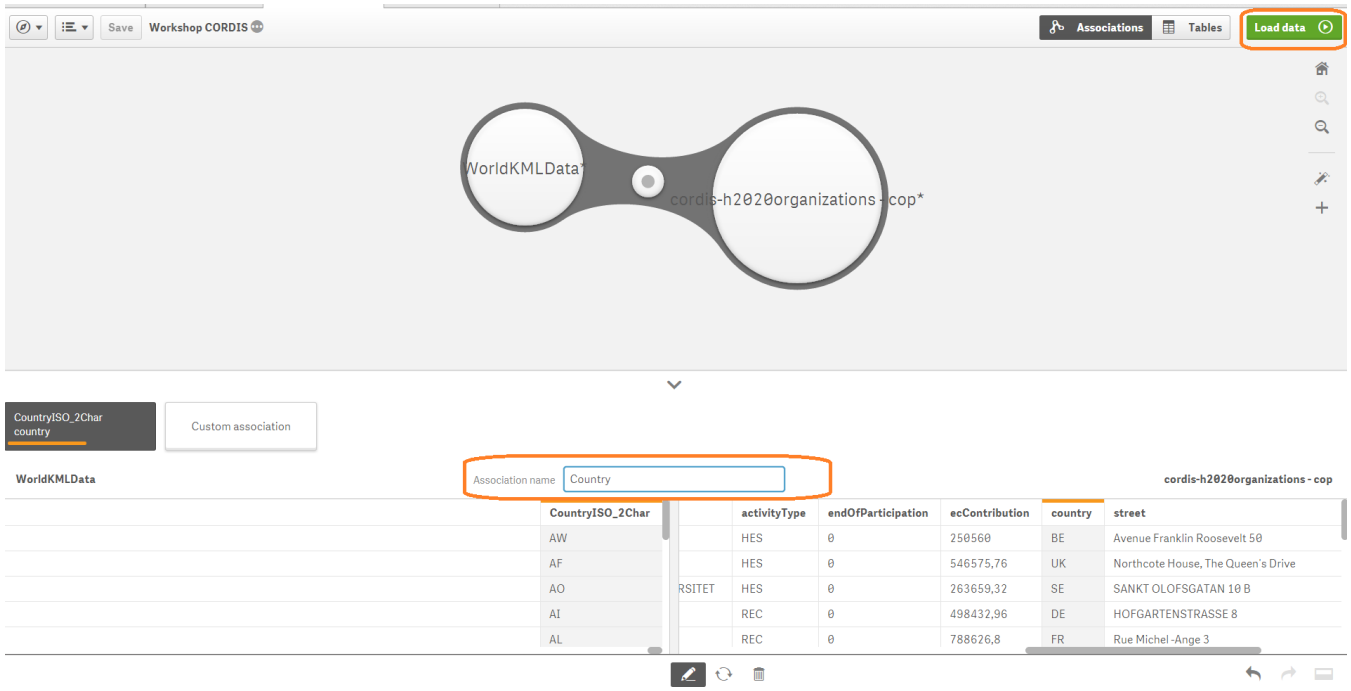
The orange colour indicates a medium level of common values. This can also be green, for a very good match, or red, for no match at all.



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.

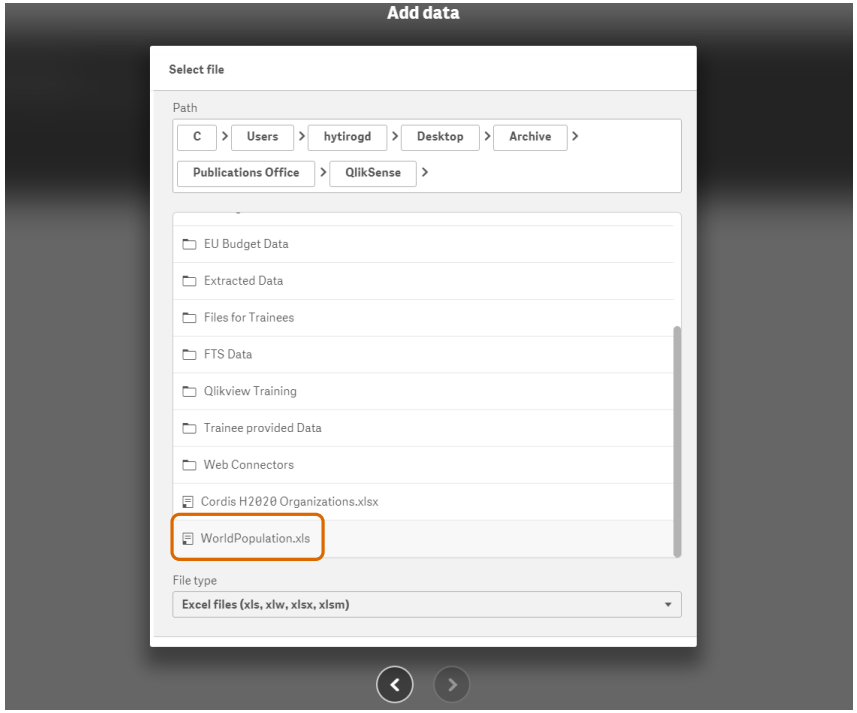


Hands on exercise
Visualising CORDIS Data

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.



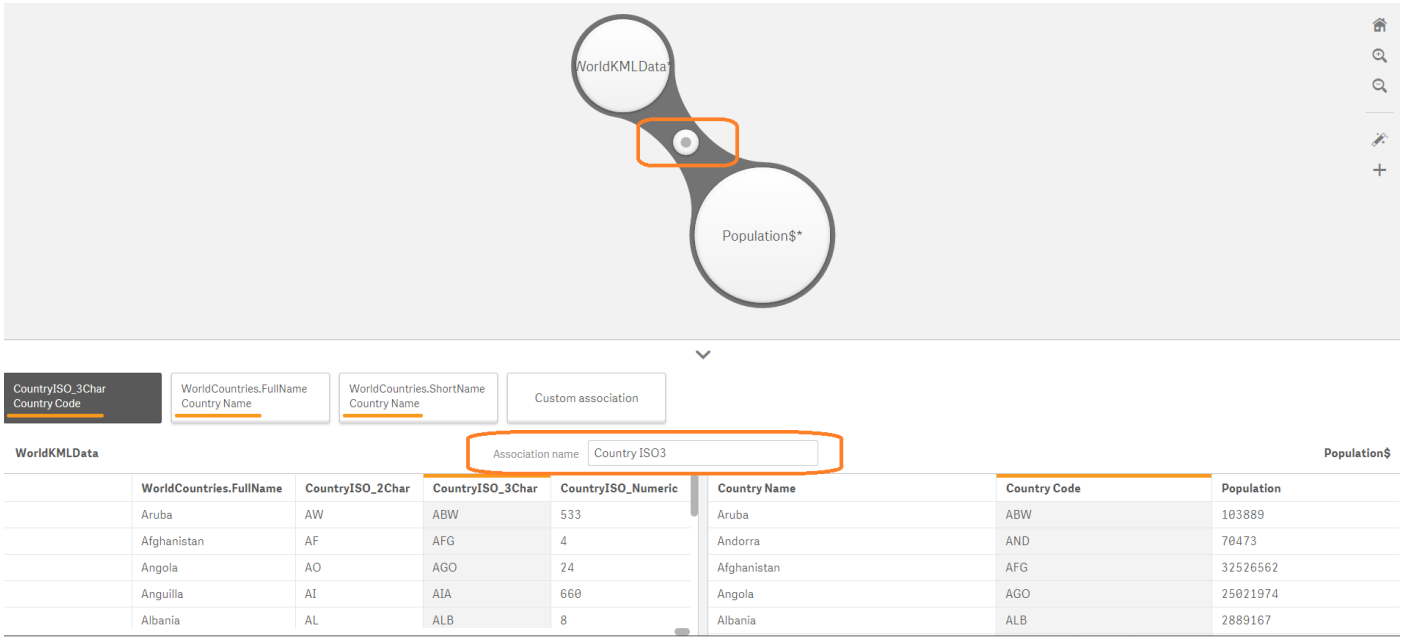
Hands on exercise
Visualising CORDIS Data

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.

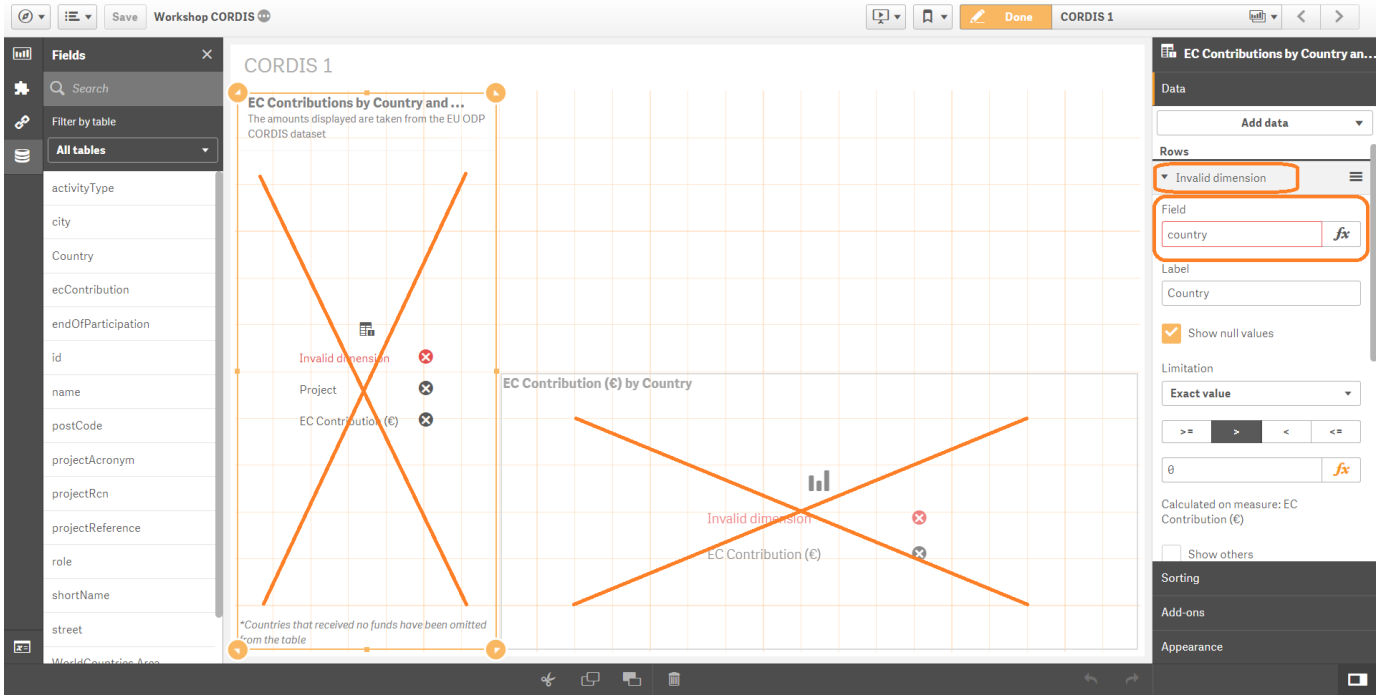


Hands on exercise
Visualising CORDIS Data

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.

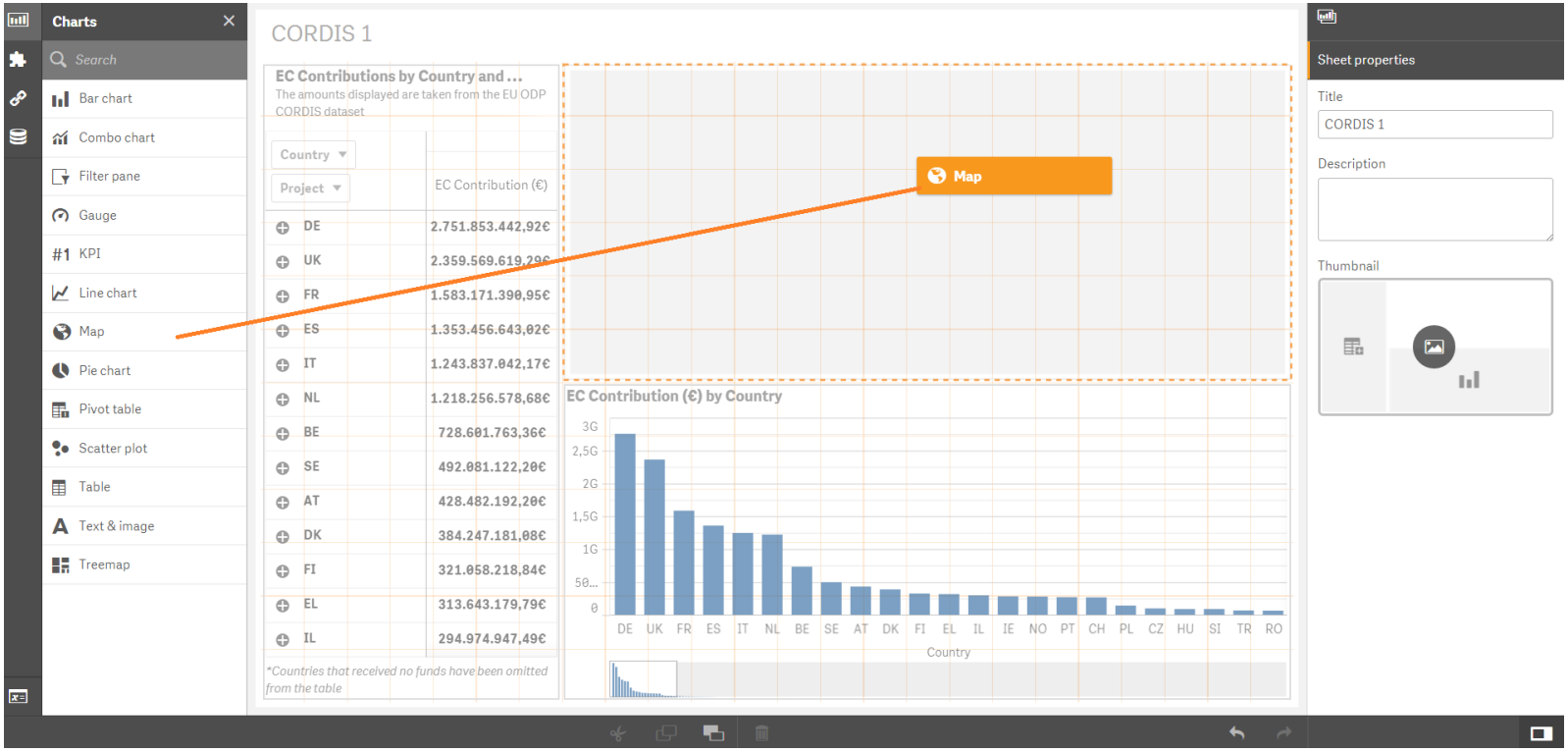


Hands on exercise
Visualising CORDIS Data

Adding a Map

Now let's add the map to our datasheet.

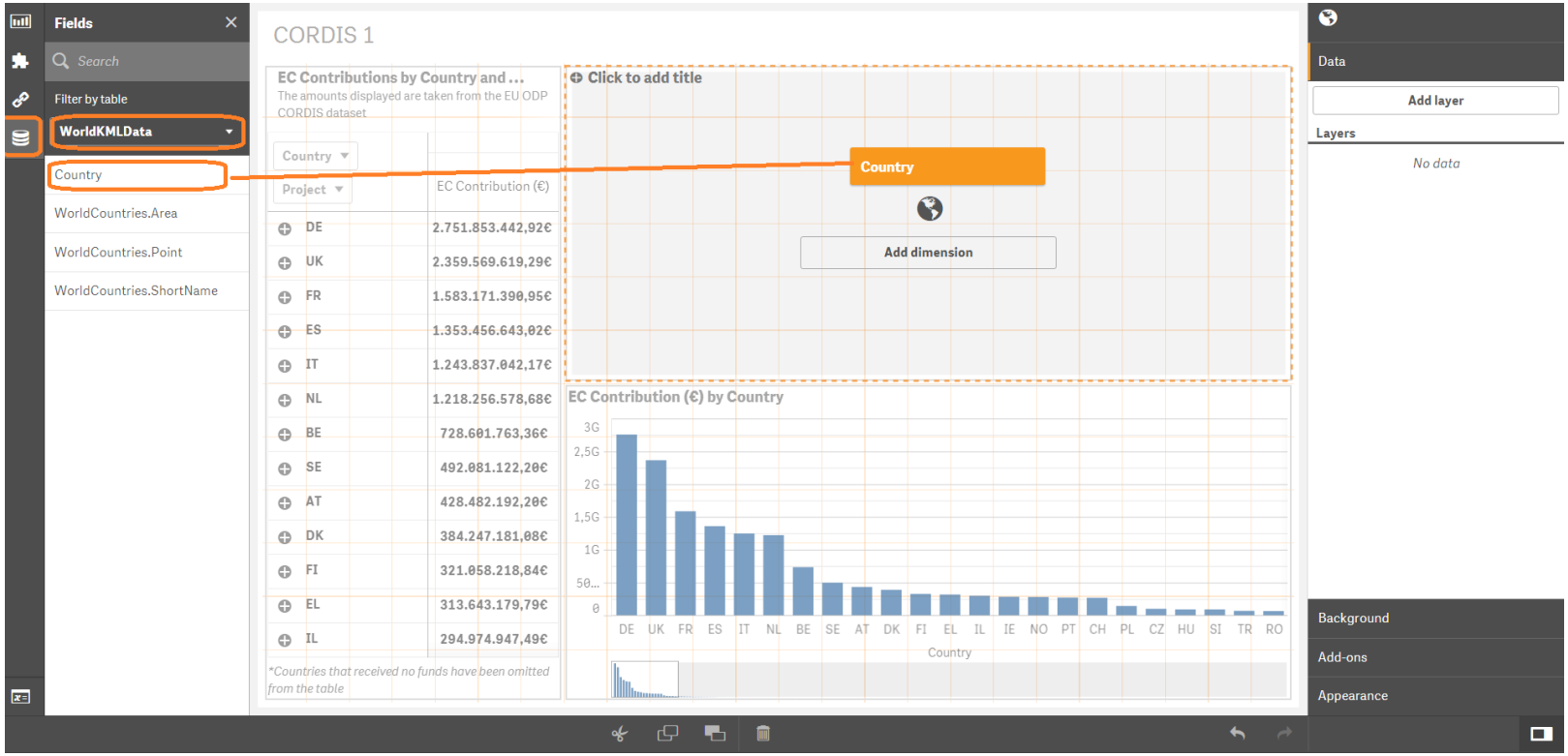
Drag and drop the "Map" chart onto the top right corner of your sheet.



Hands on exercise
Visualising CORDIS Data

Adding a Map

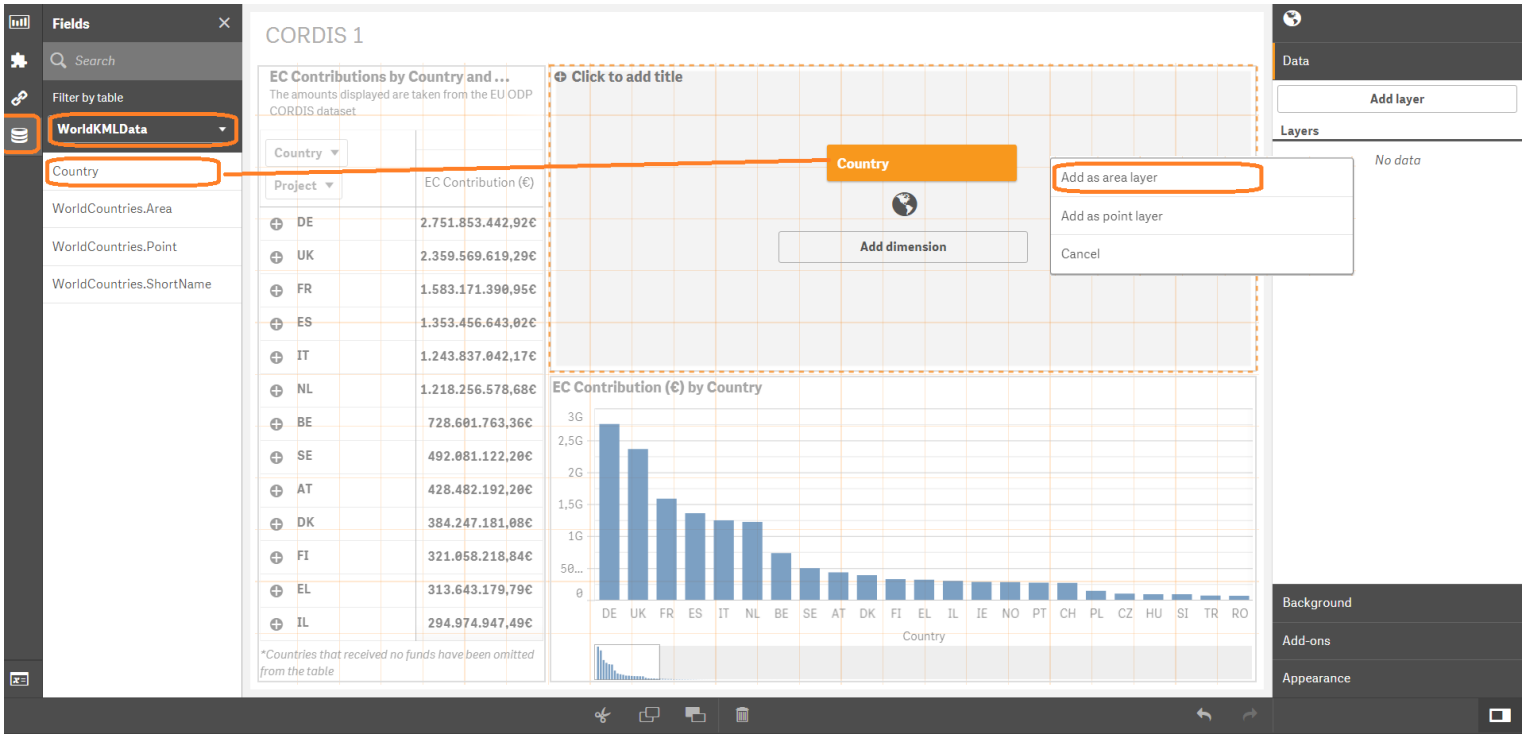
Find the "Country" field in the "Fields" menu under "WorldKMLData" and drag and drop it onto the map chart.



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".

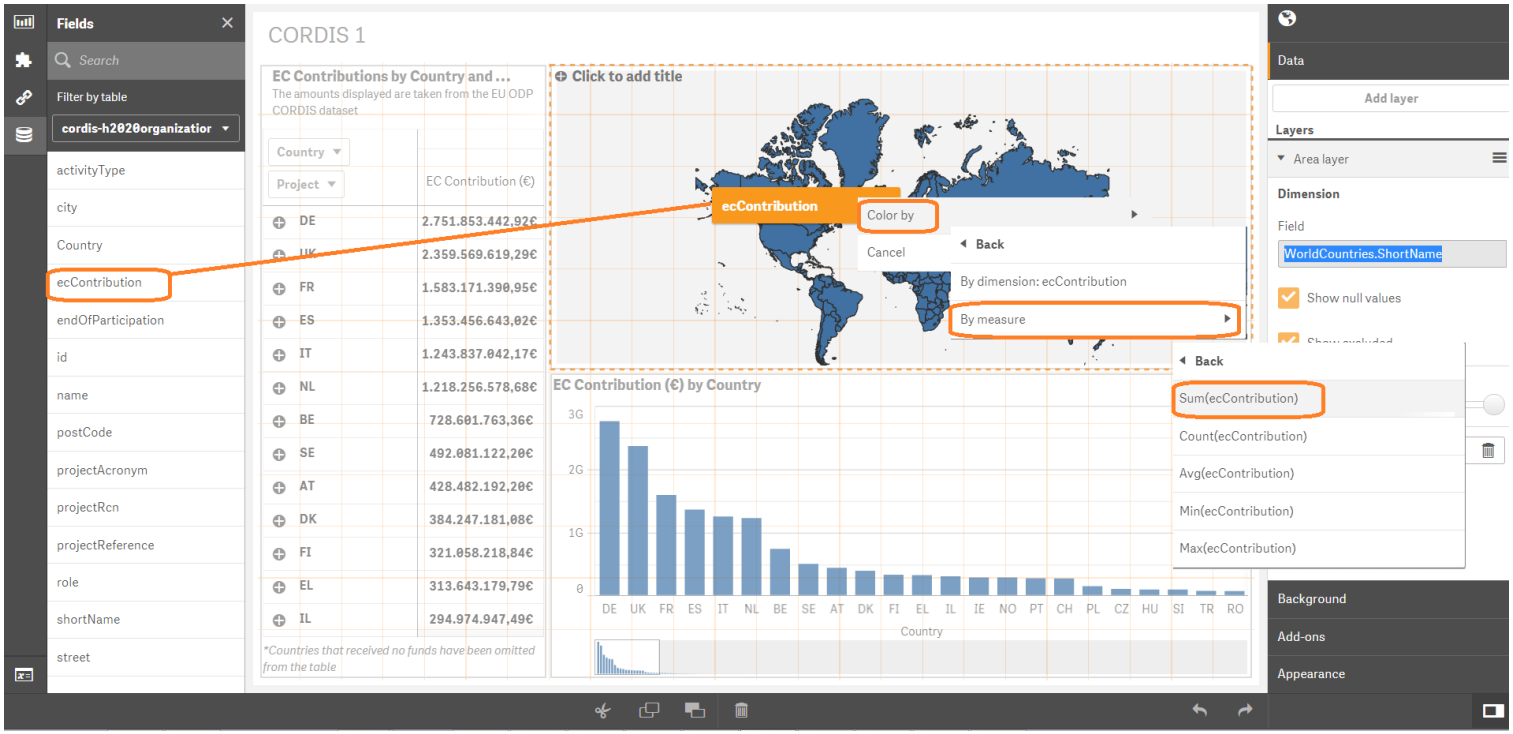


Hands on exercise
Visualising CORDIS Data

Adding a Map

Next we must add the contribution data to our map.

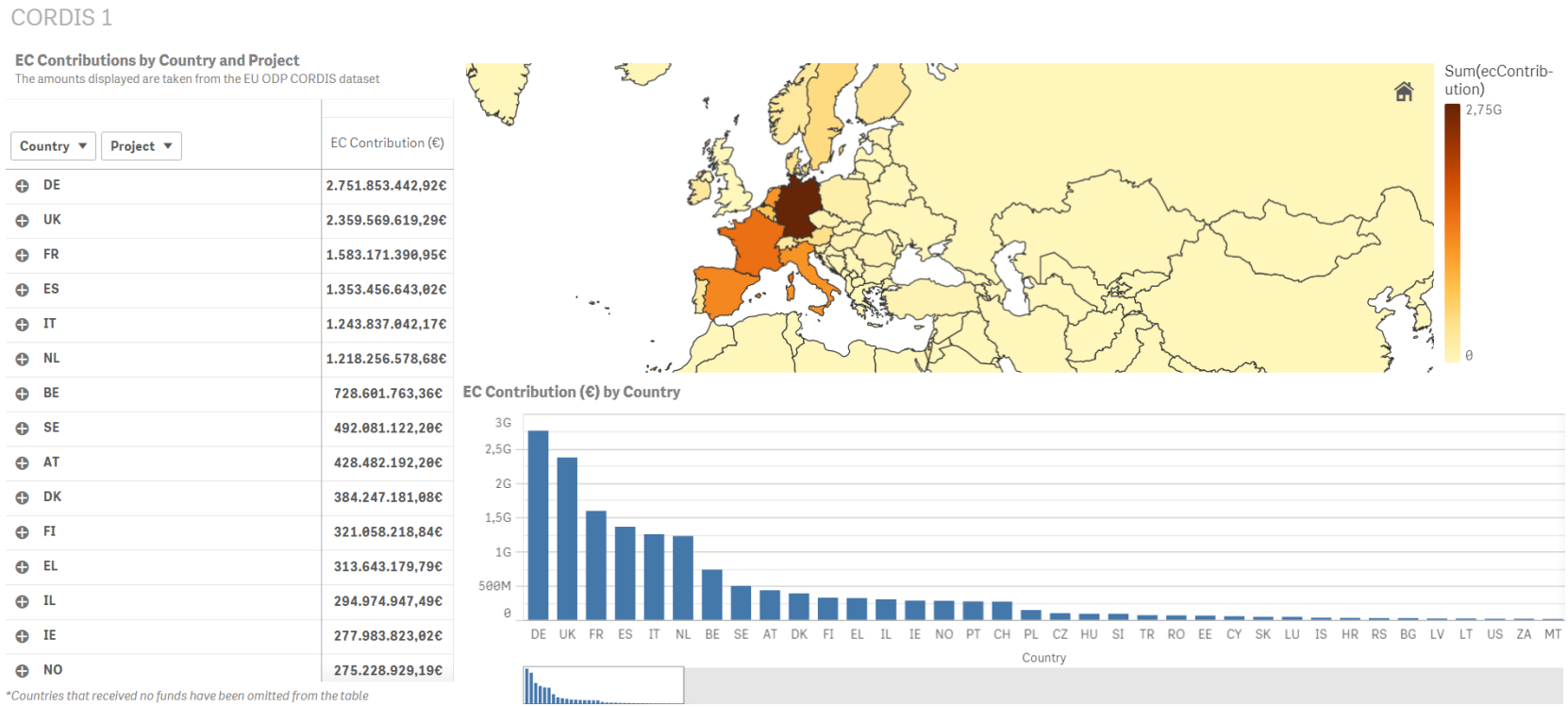
Drag and drop ecContribution onto the map and select "Color by" -> "By measure" -> "Sum(ecContribution)"



Hands on exercise
Visualising CORDIS Data

Adding a Map

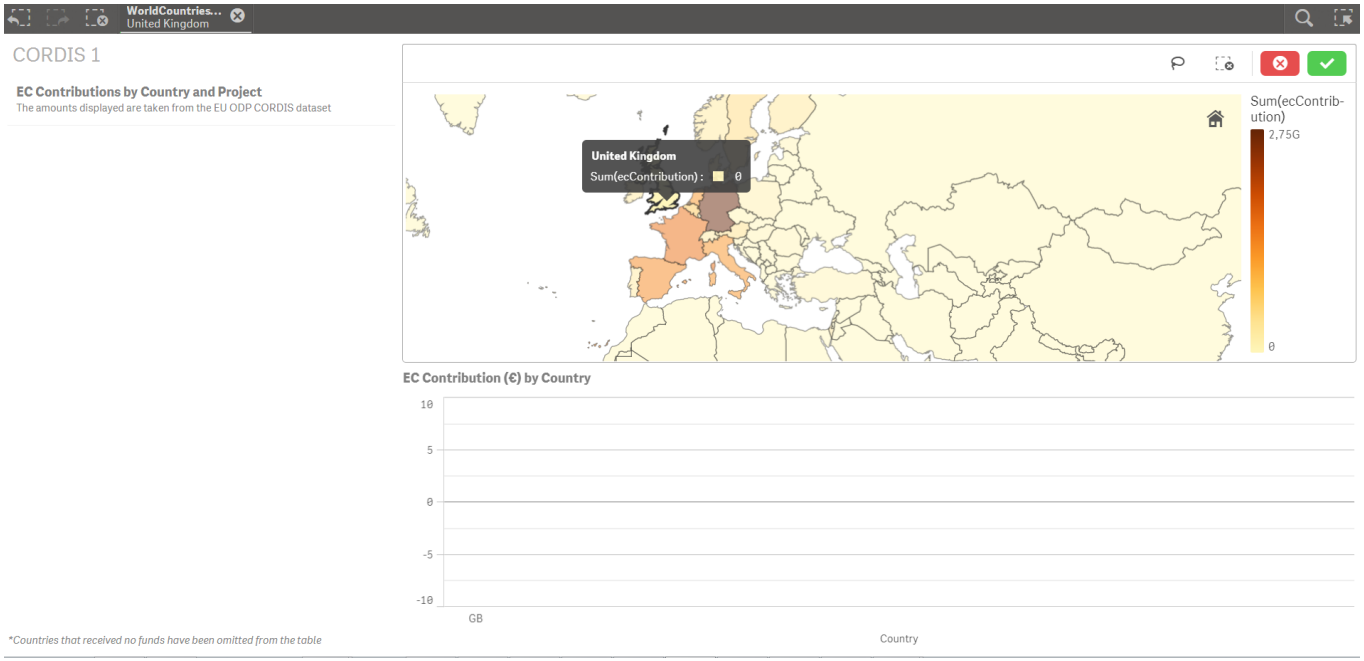
The result should look somewhat like this.



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.



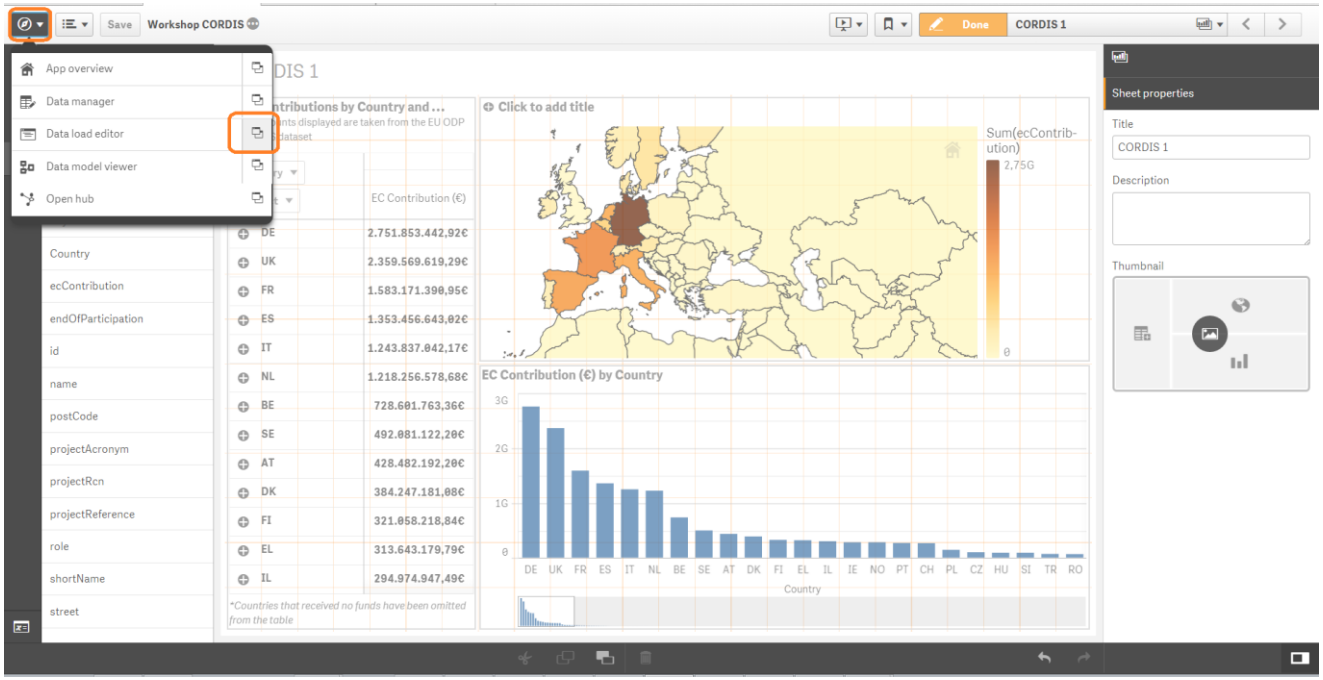
Hands on exercise

Visualising CORDIS Data

Adding a Map

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

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

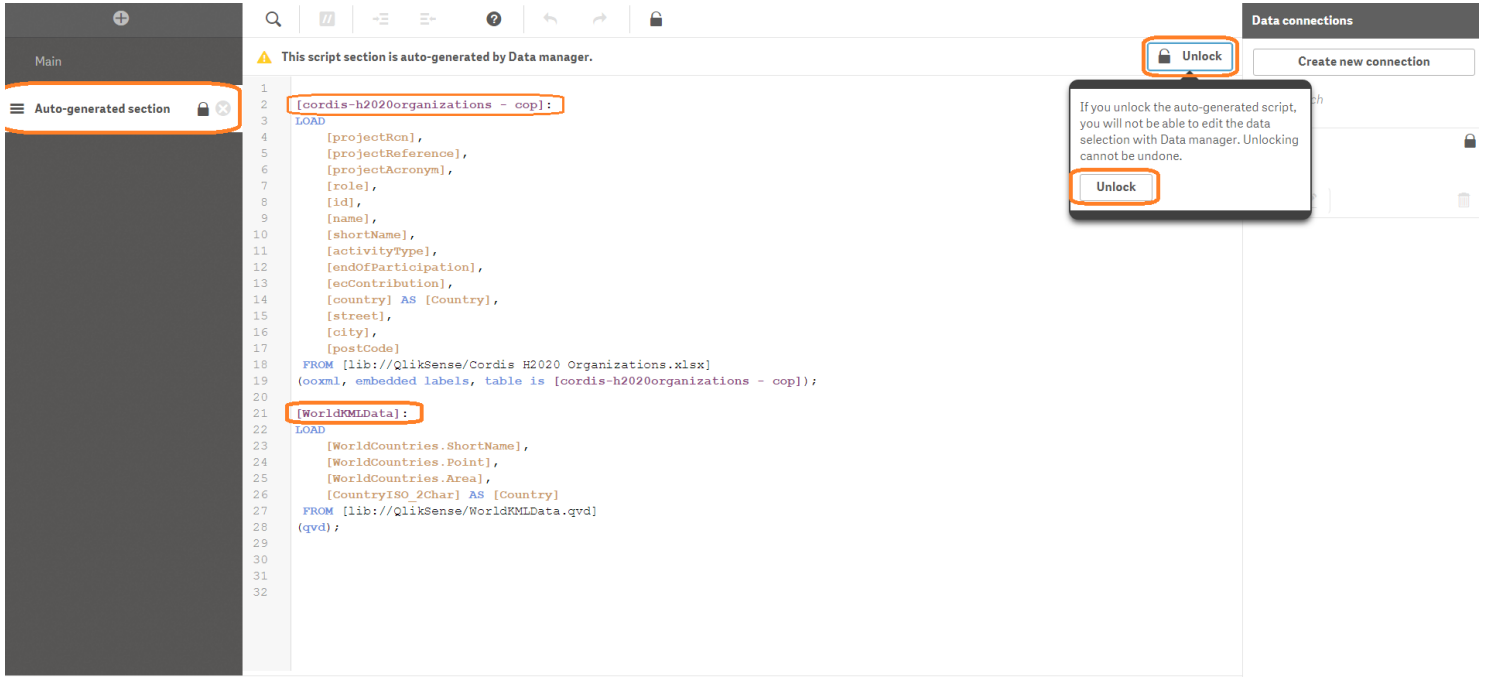


Hands on exercise
Visualising CORDIS Data

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.



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".

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".

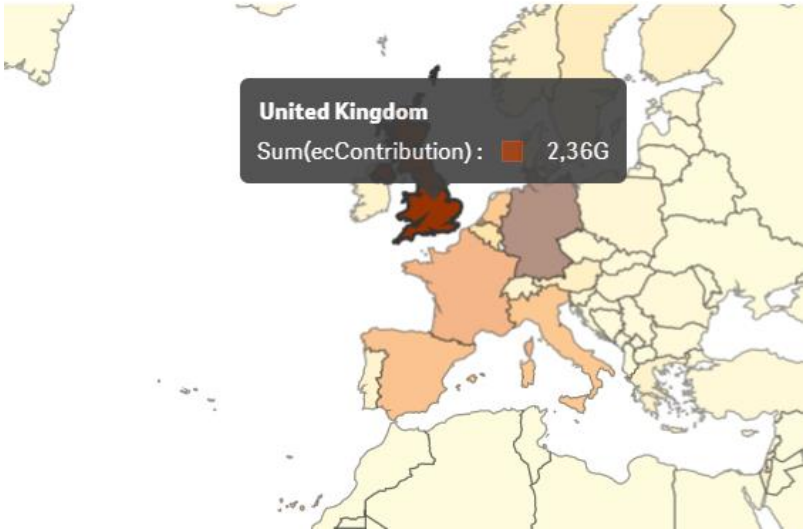
CODE:

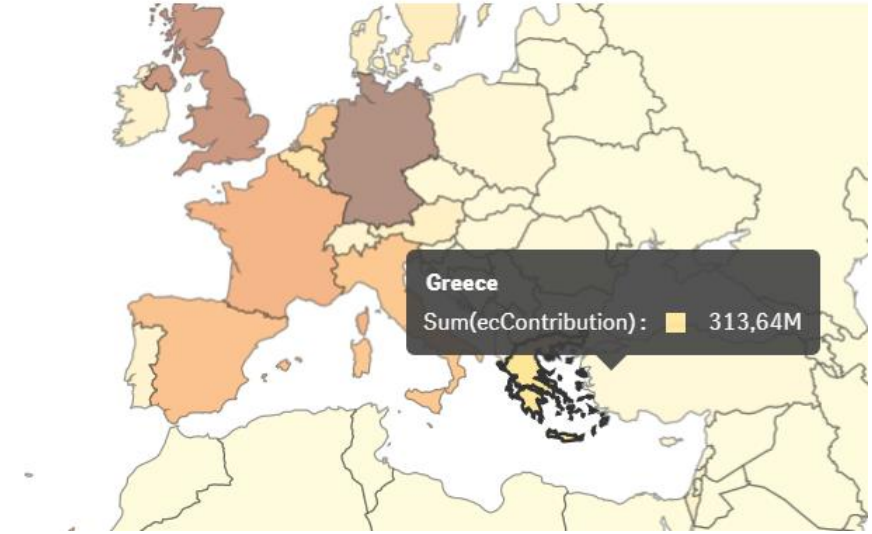
```
if([CountryISO_2Char]='GR','EL',if([CountryISO_2Char]=
'GB','UK',[CountryISO_2Char])) AS [Country]
```

Hands on exercise
Visualising CORDIS Data

Adding a Map

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



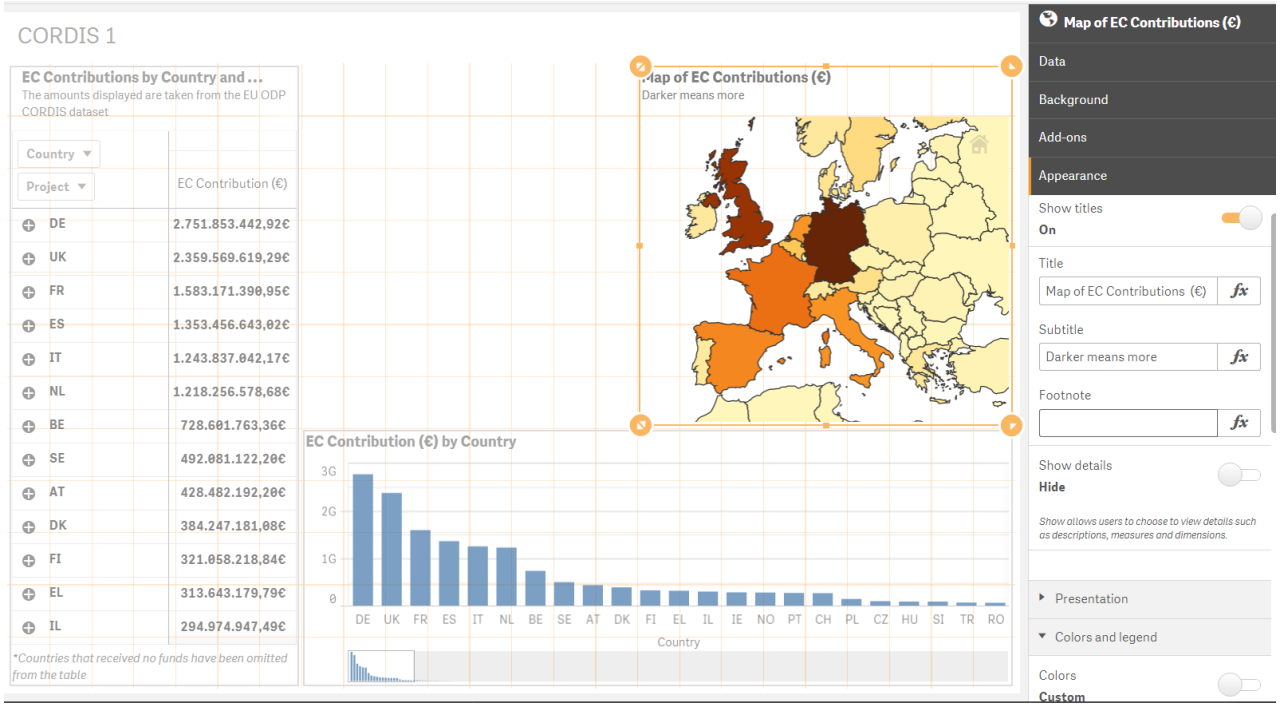


Hands on exercise
Visualising CORDIS Data

Adding a Map

Now that we have our data working, let's finalise the appearance of our map.

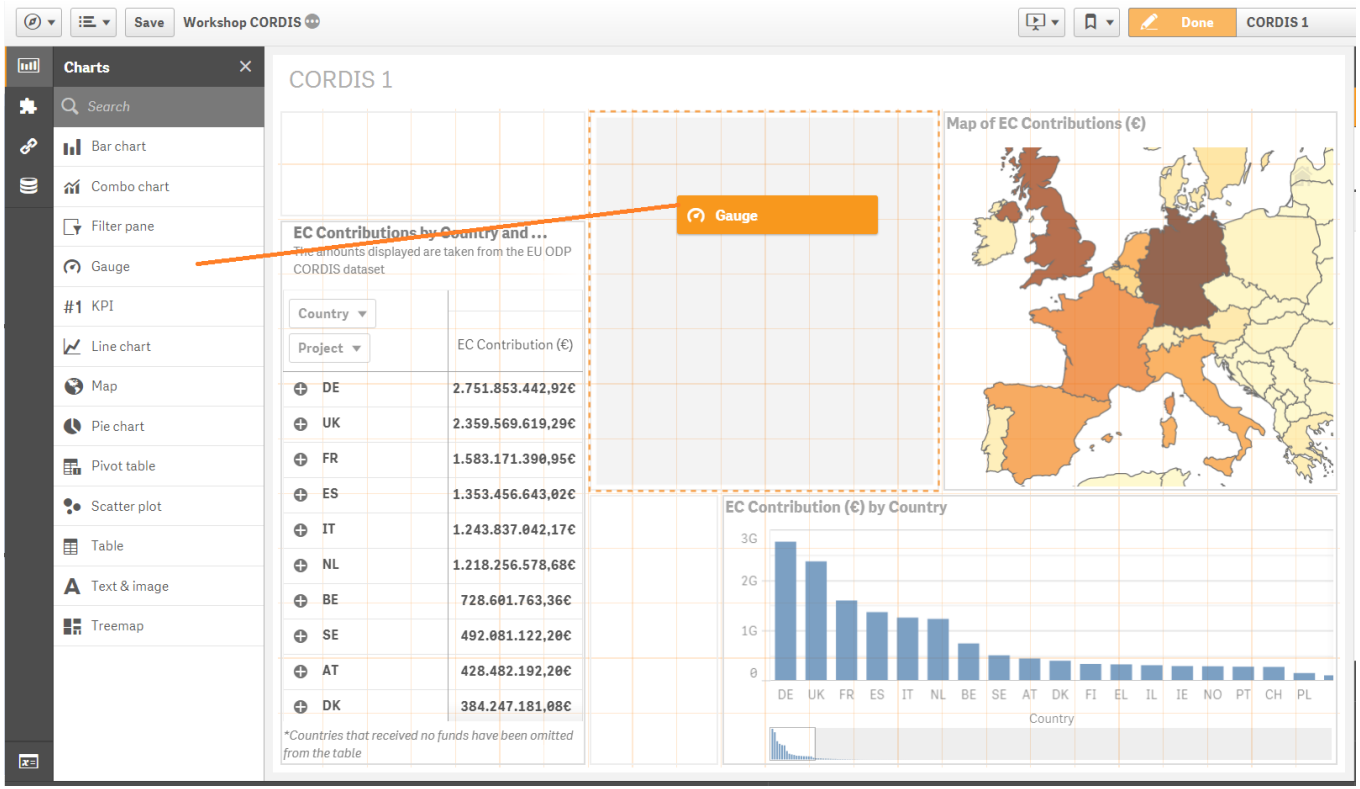
Add a title, remove the legend and position it at the right in a square shape.



Hands on exercise
Visualising CORDIS Data

Adding a Gauge

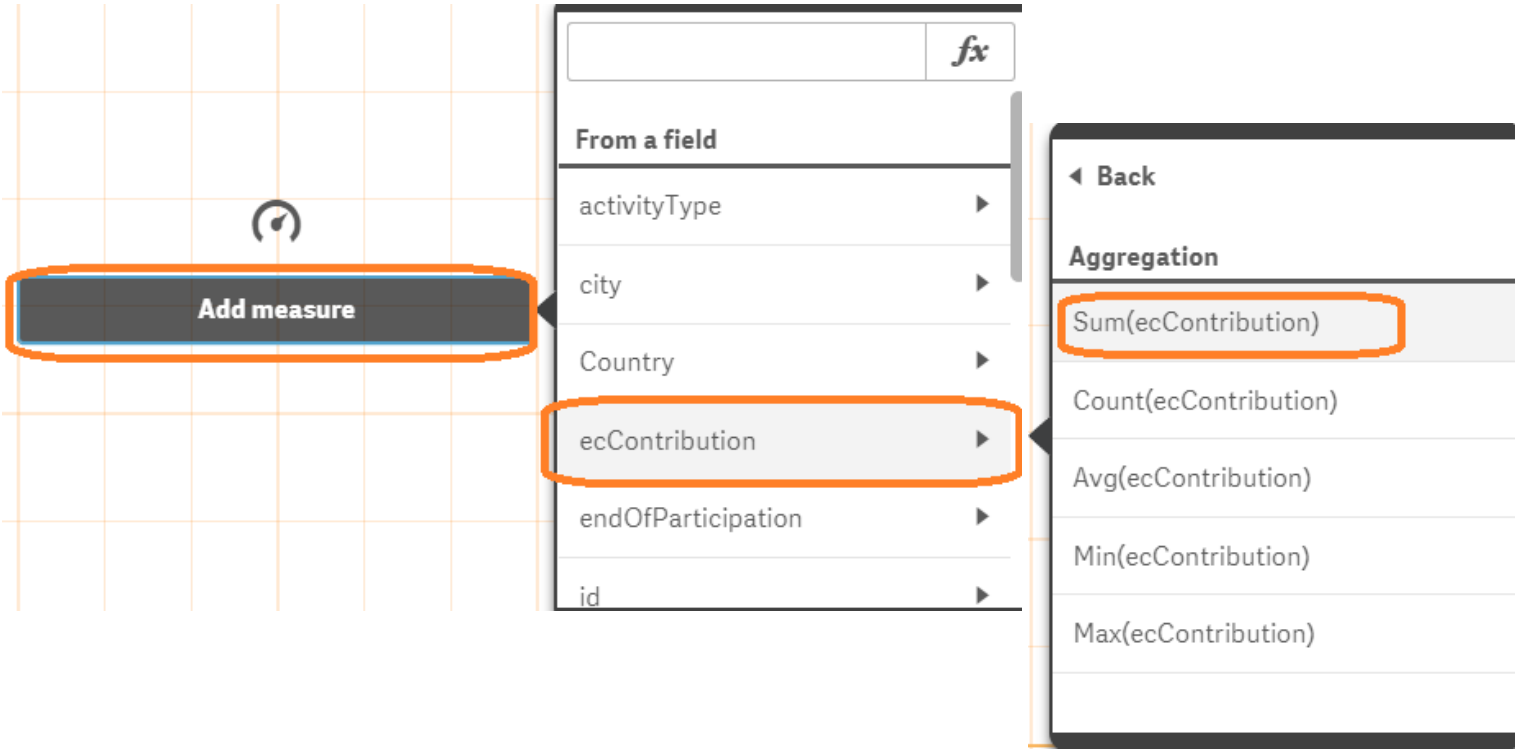
Now we will add a gauge to sum up our selections and display the part of total we have gathered. *Drag and drop the gauge chart onto your sheet.*



Hands on exercise
Visualising CORDIS Data

Adding a Gauge

Add the measure "ecContribution" to your gauge.

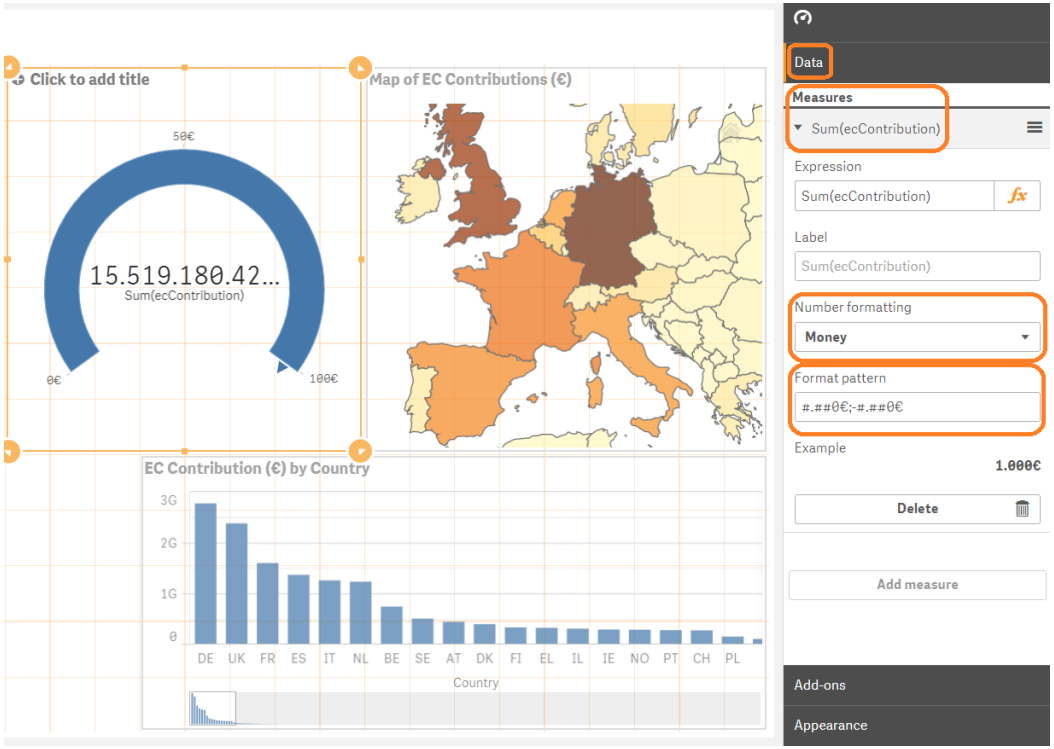


Hands on exercise
Visualising CORDIS Data

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

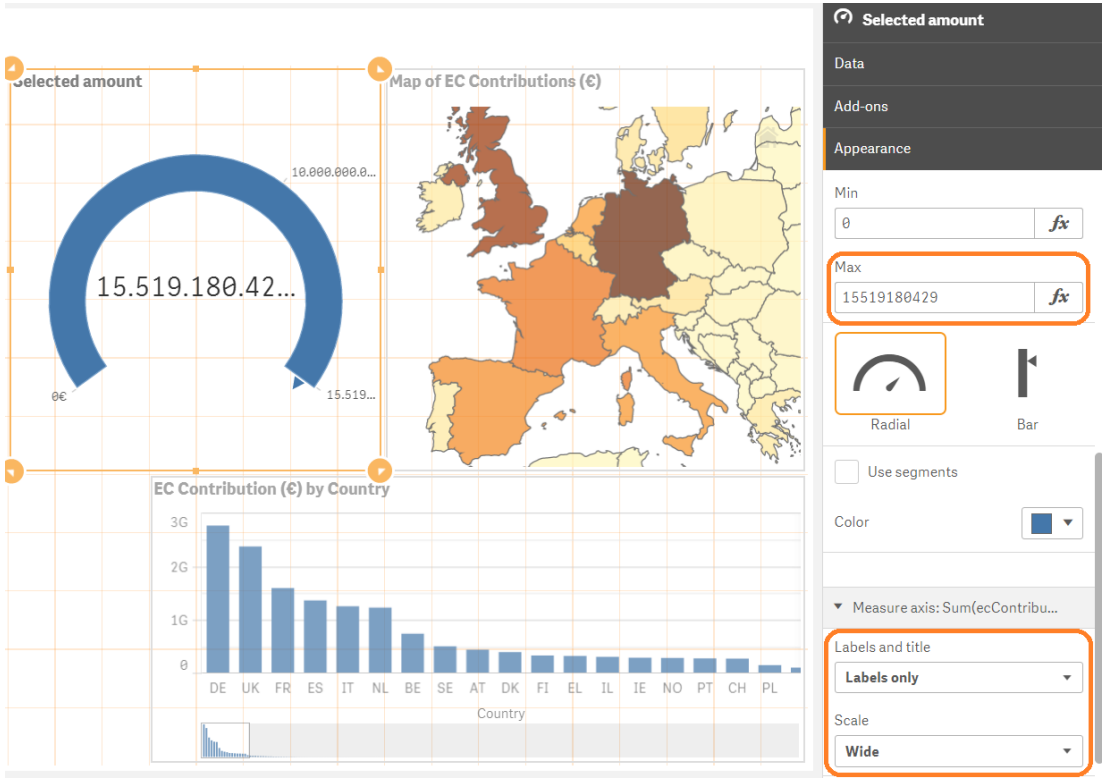
Now let's refine our gauge according to our purpose.

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.

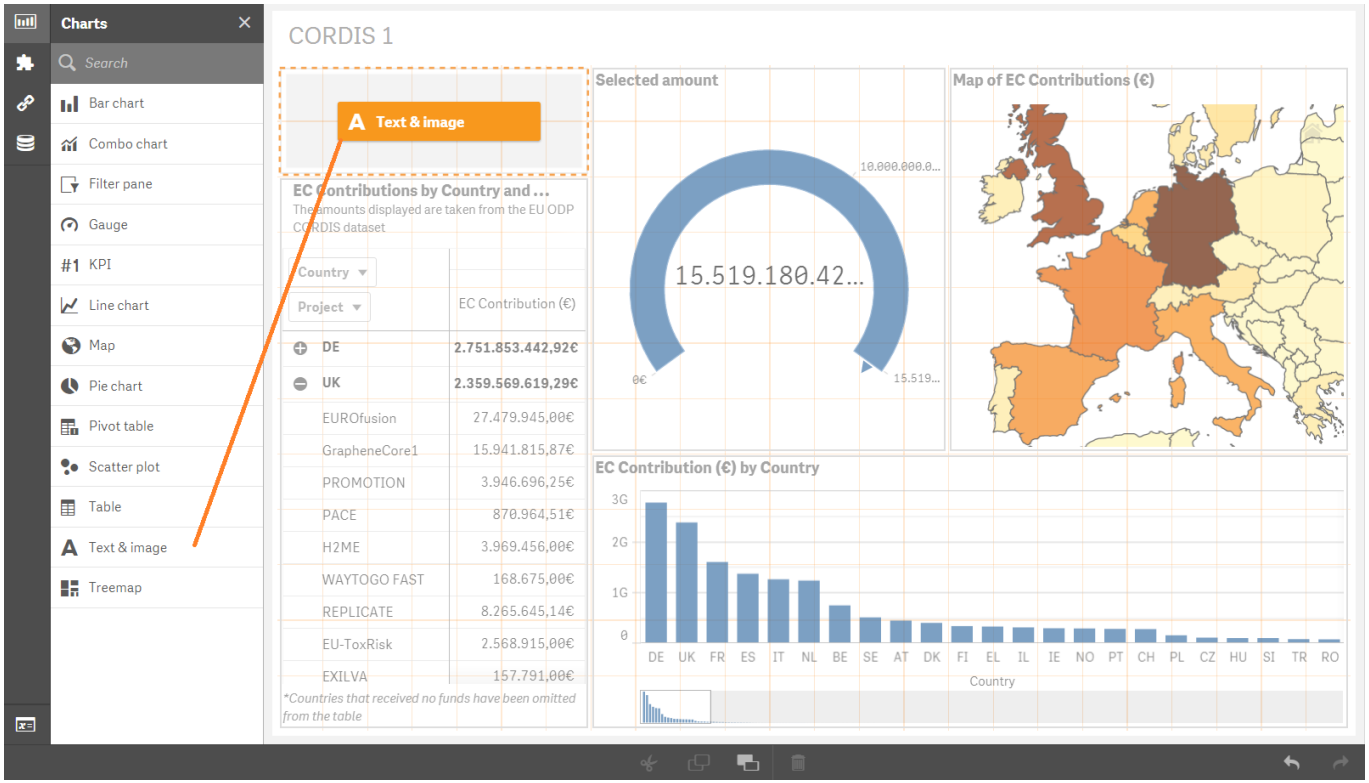


Hands on exercise
Visualising CORDIS Data

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:

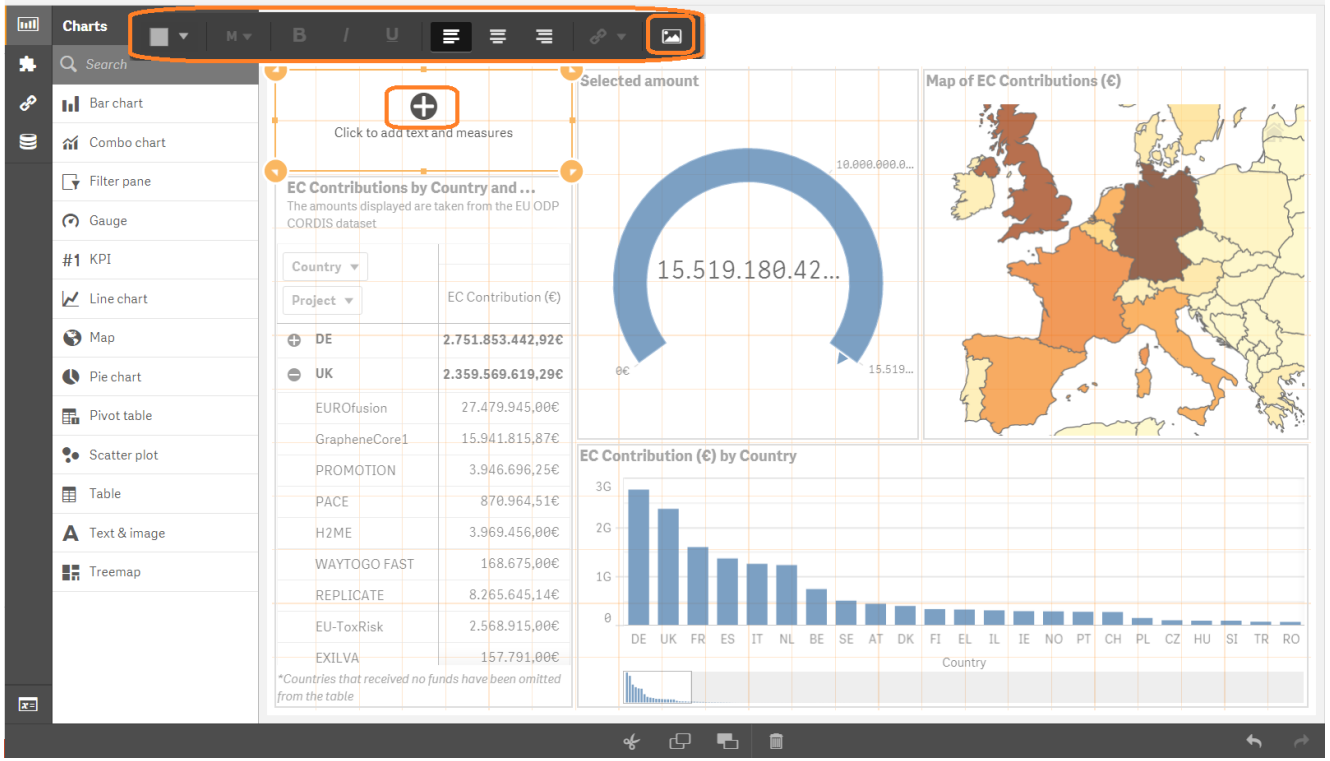
C:\Users\<user>\Documents\Qlik\Sense\Content\Default

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

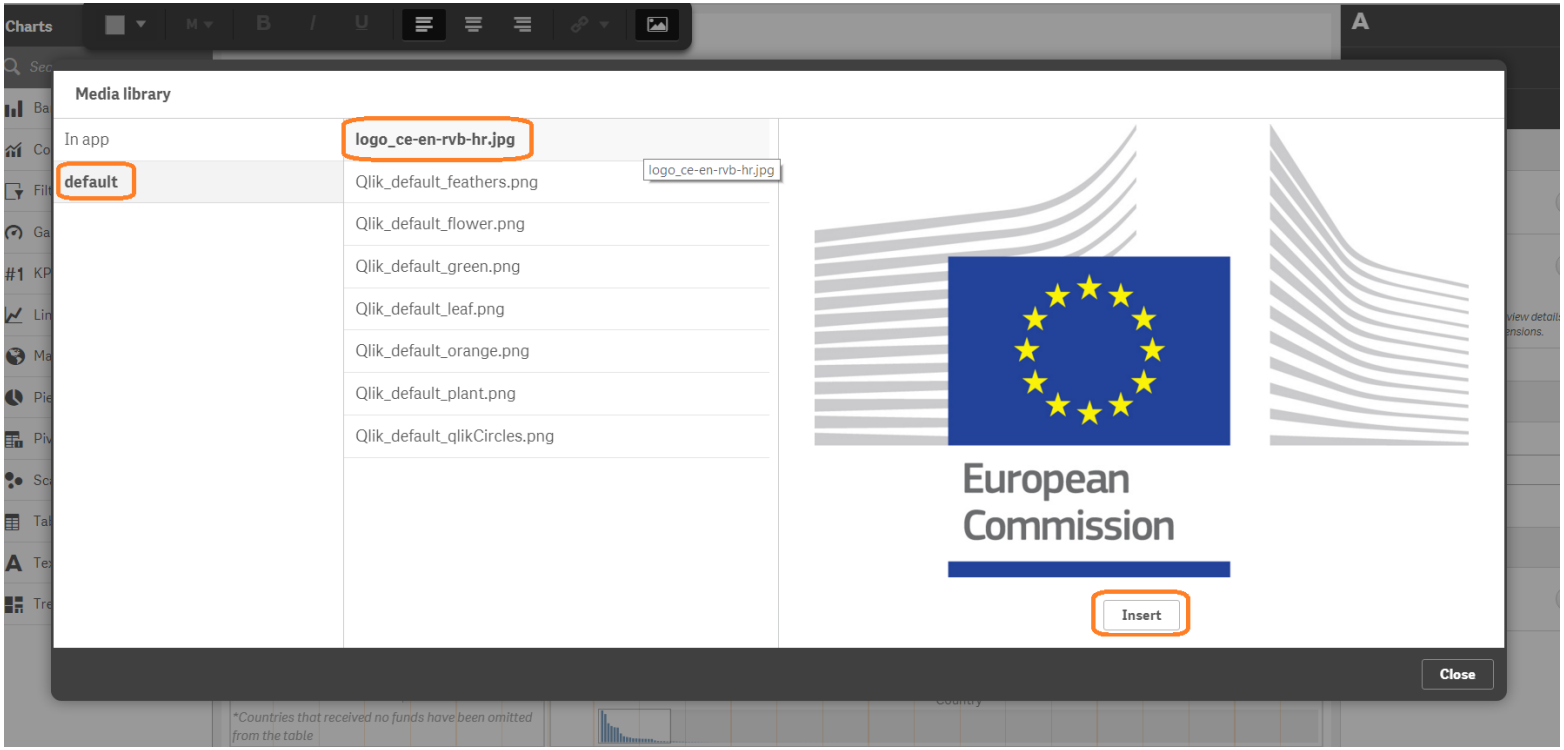
Click on the cross and from the menu that appears click on the image icon at the right.



Hands on exercise
Visualising CORDIS Data

Adding a Logo

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

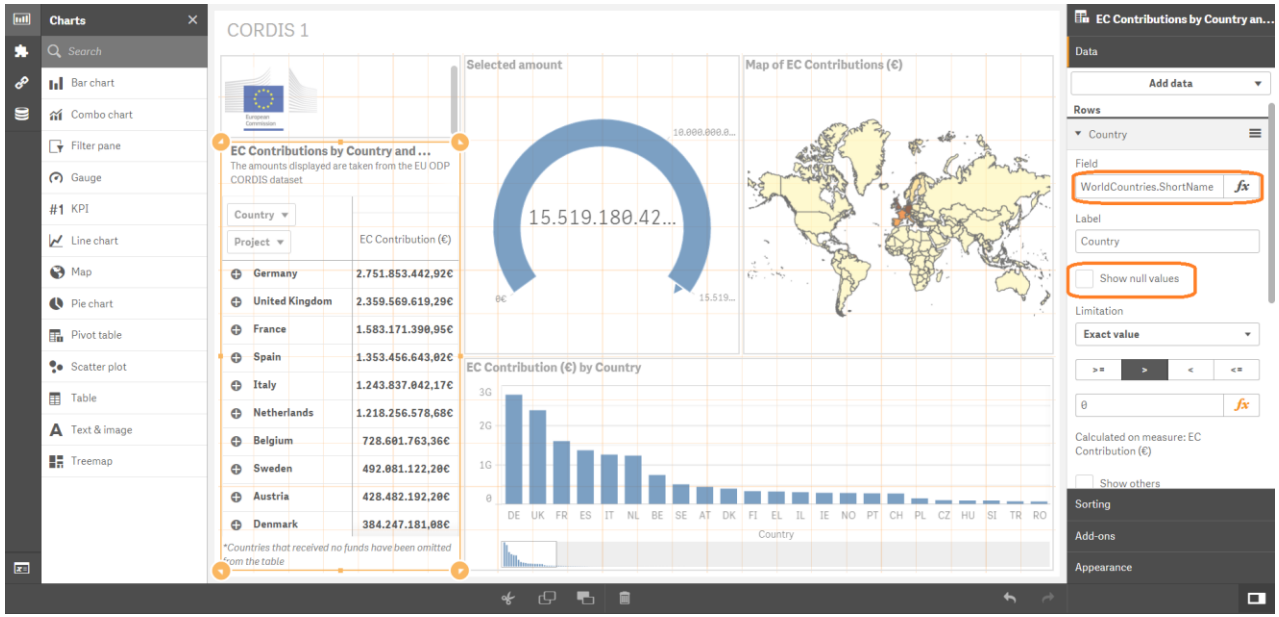


Hands on exercise
Visualising CORDIS Data

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".*

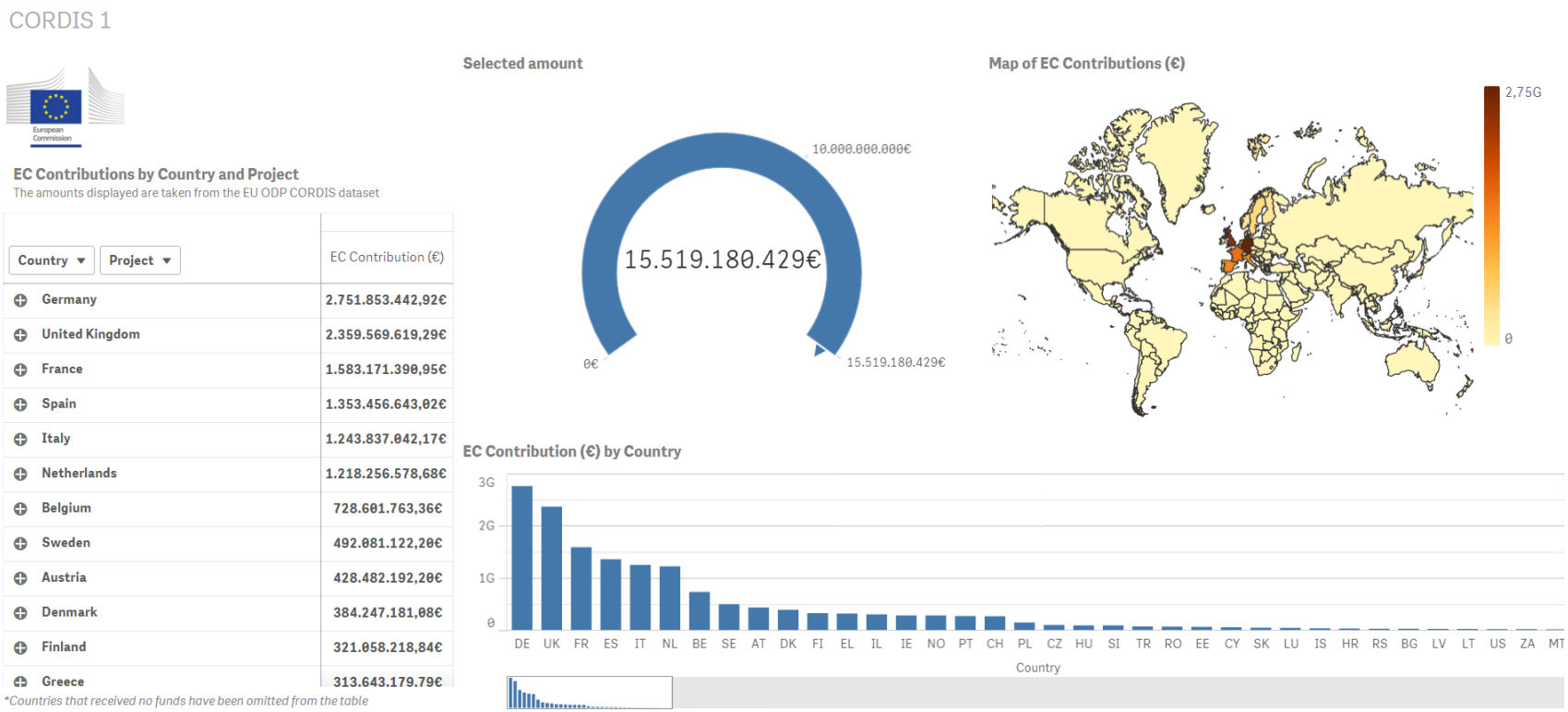
Remember! Each name is still connected with the correct contribution value through the common "Country" field.



Hands on exercise
Visualising CORDIS Data

First sheet done!

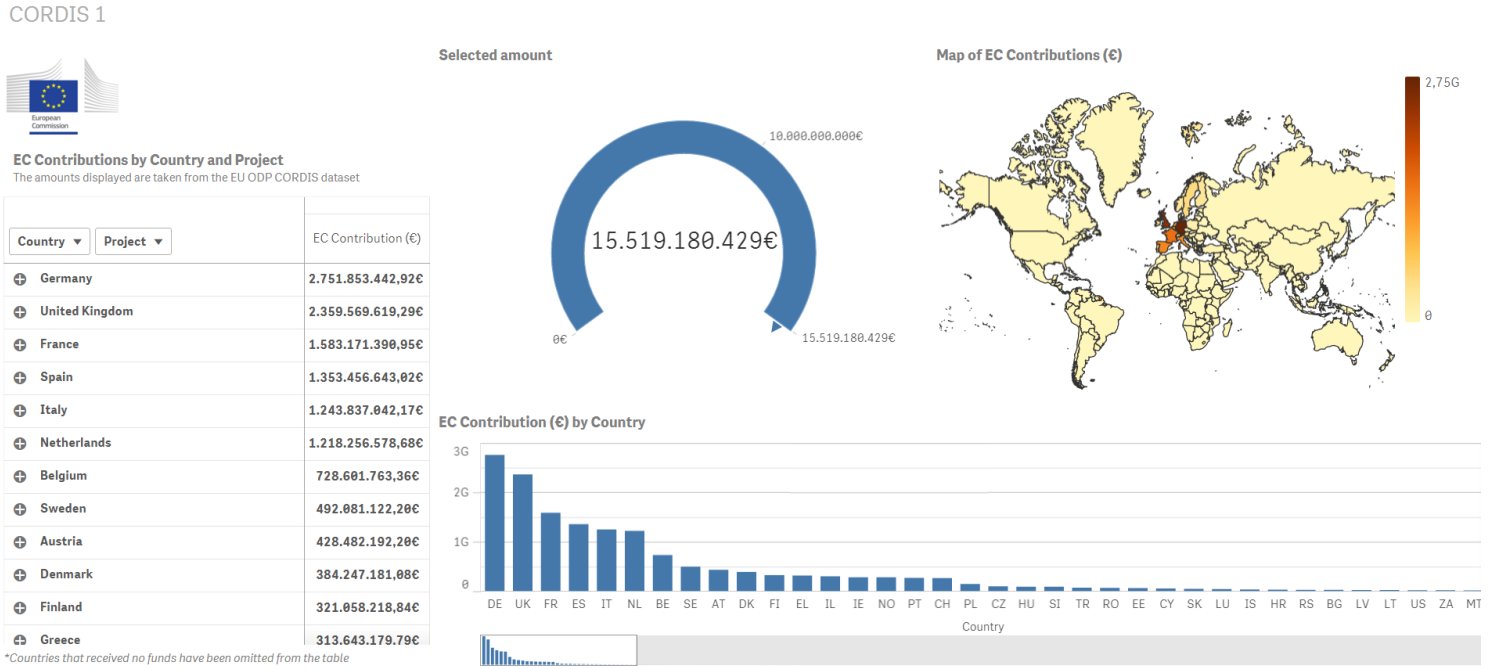
Click on "Done" and admire your first sheet. Congratulations!



Hands on exercise
Visualising CORDIS Data

Shifting perspective

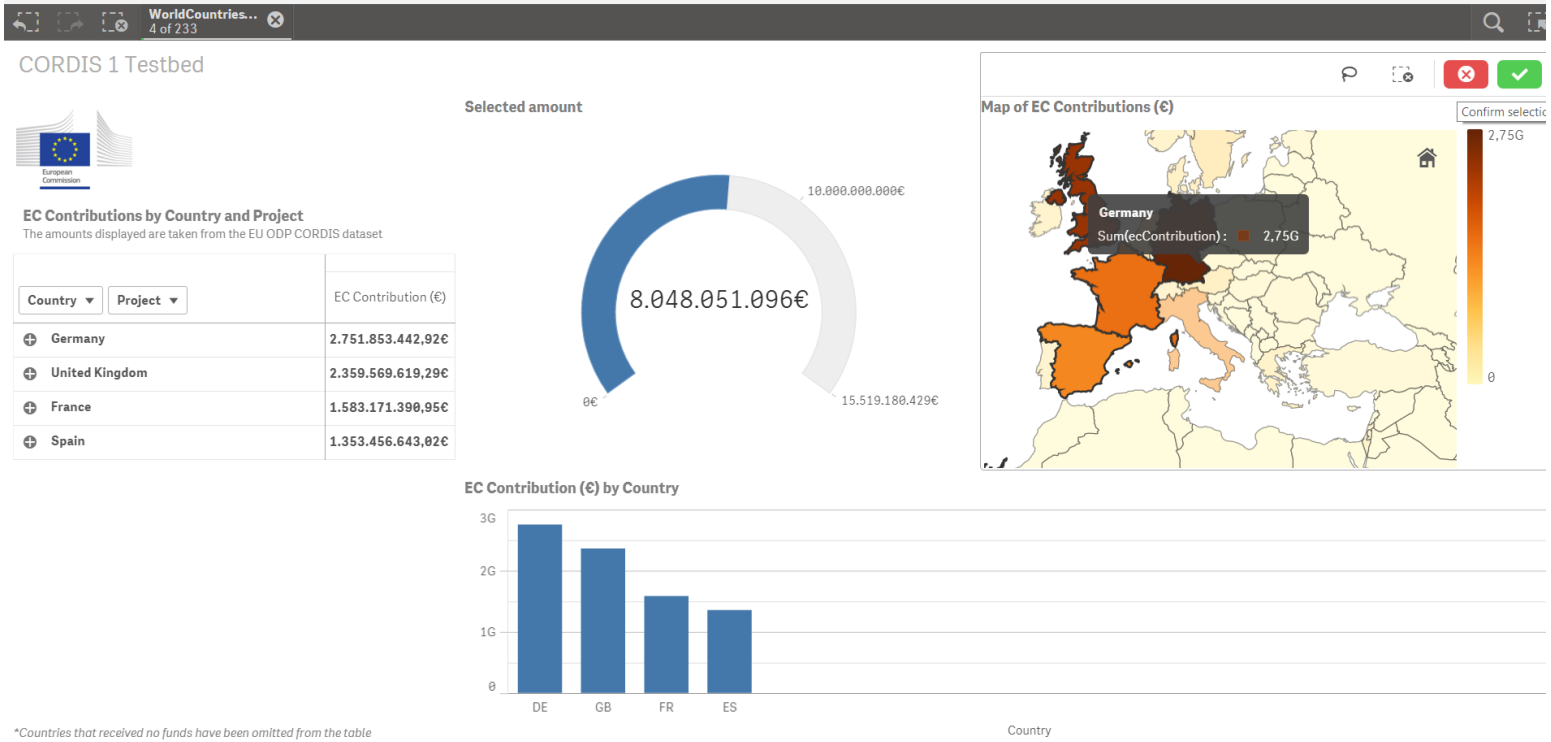
However! There is a slight issue with this sheet. As we by now all agree, visualisations can be misleading. In this case and particularly due to the map and bar chart, one could come to the conclusion that certain countries are granted an uneven amount of funds. But is this really the case..?



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!

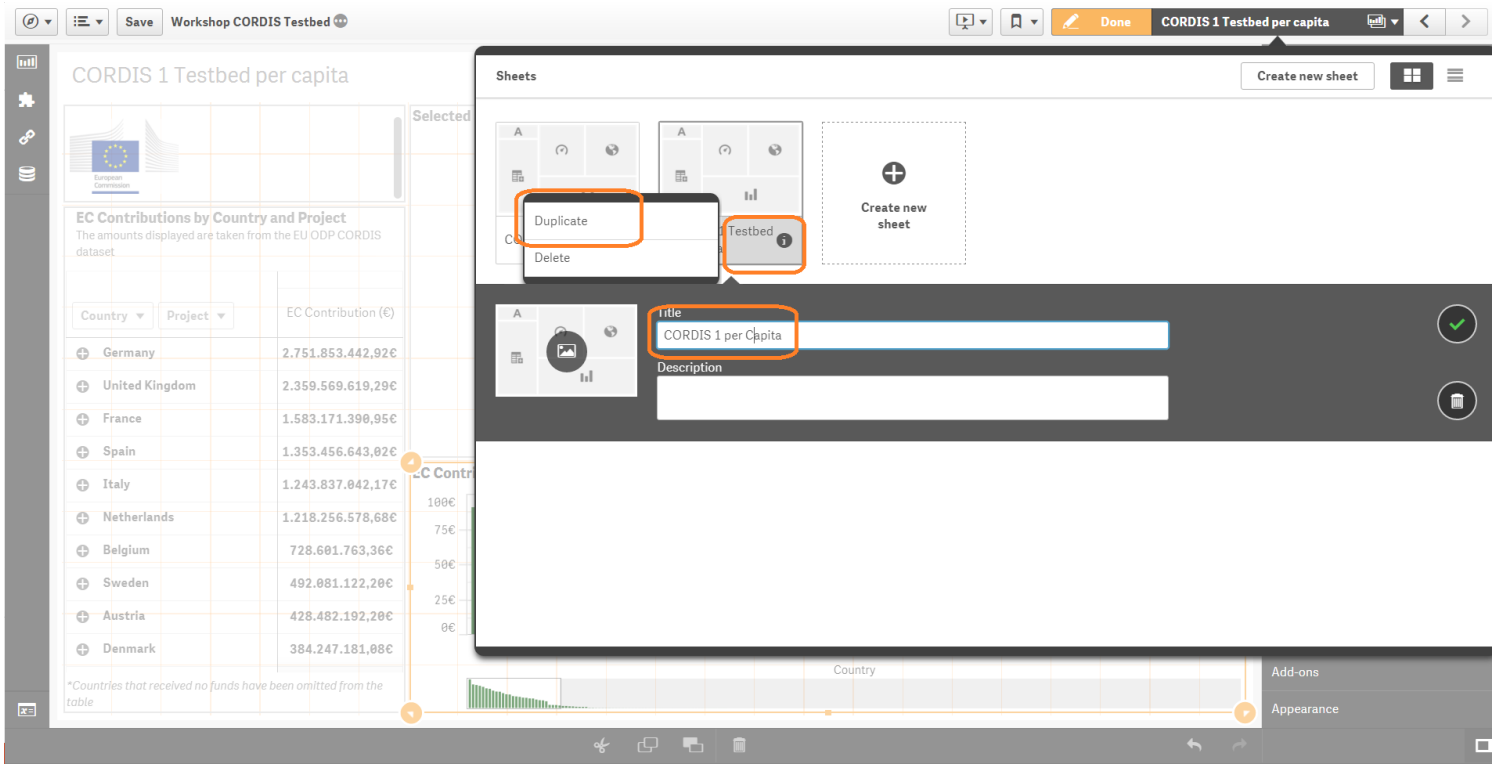
This should provide us with different insights.

Hands on exercise
Visualising CORDIS Data

Shifting perspective

Open your sheets menu, right-click on your first sheet and select "Duplicate".

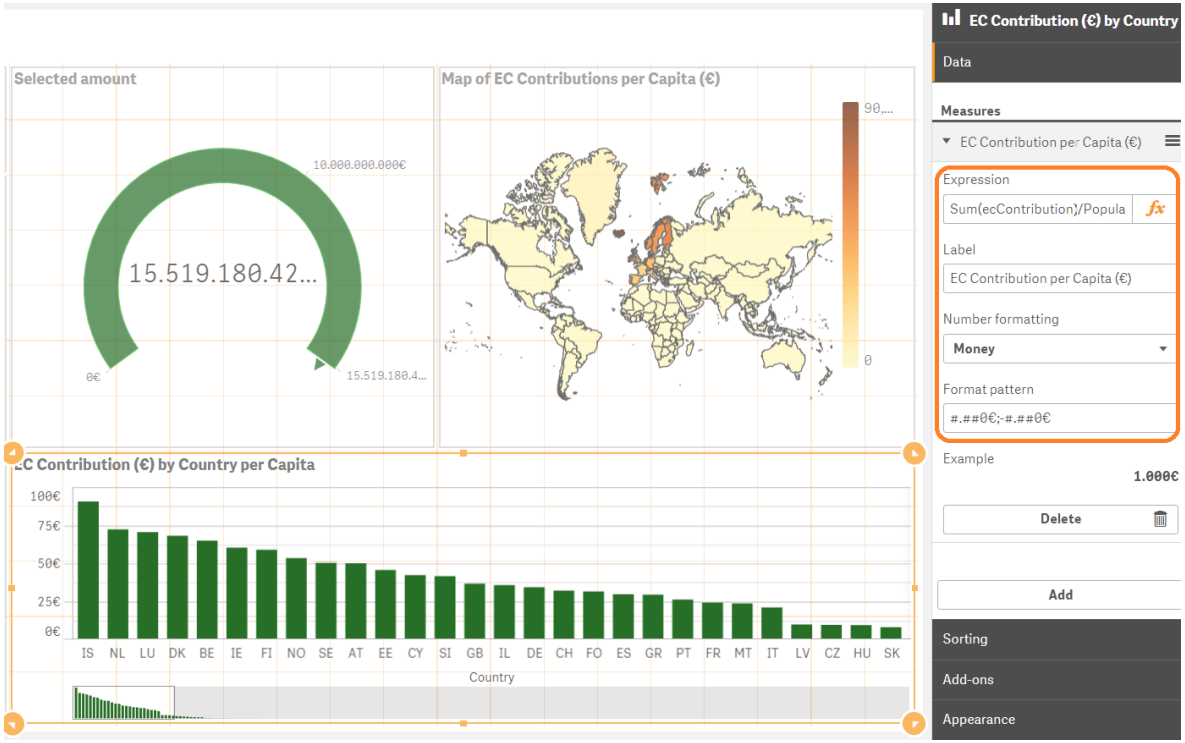
Rename the duplicate sheet to "CORDIS per Capita" and open it.



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

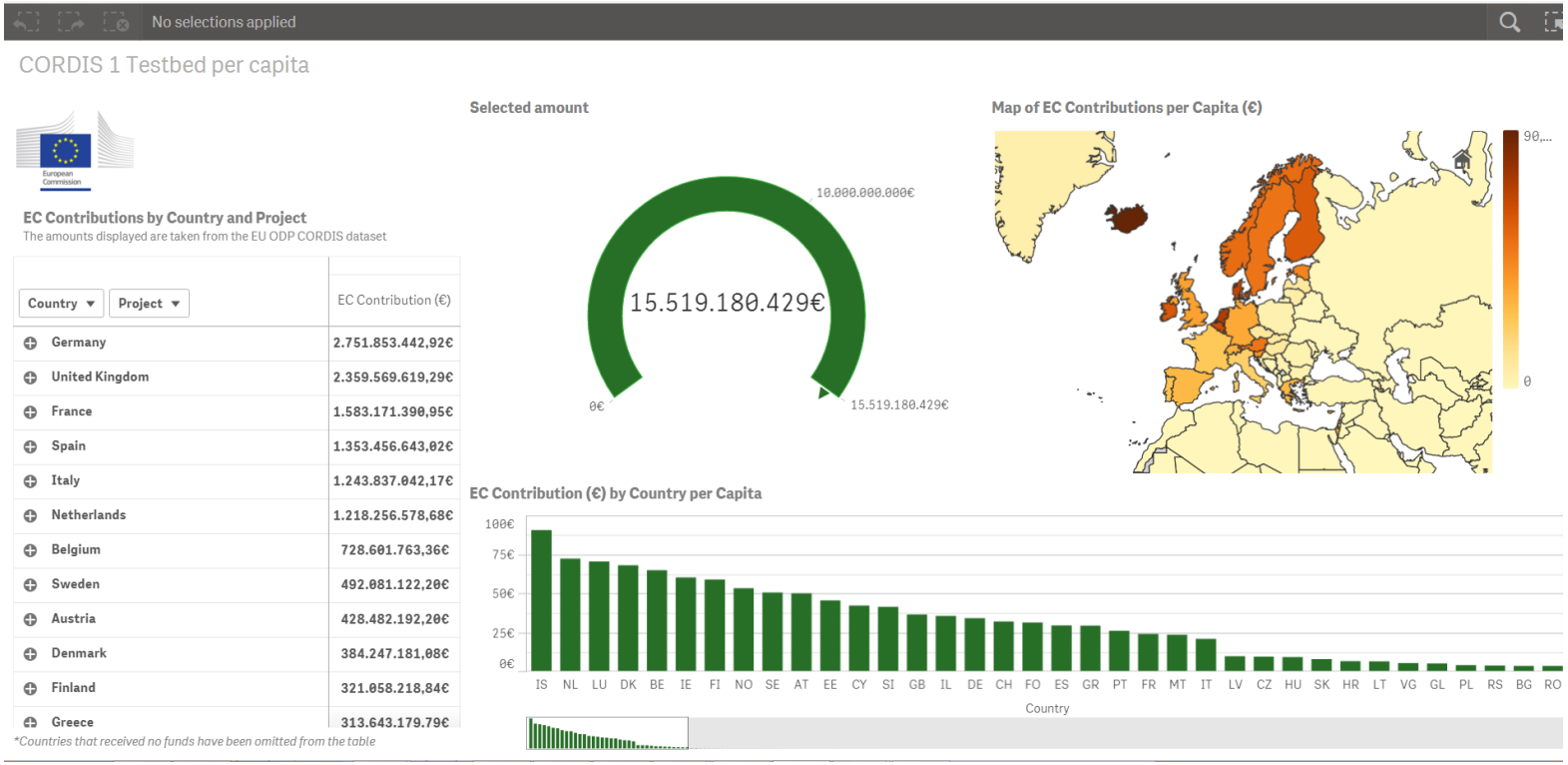
Shifting perspective

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

Demo

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= { "f*" }> } 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

Disclaimers

This presentation has been carefully compiled by PwC, but no representation is made or warranty given (either express or implied) as to the completeness or accuracy of the information it contains. PwC is not liable for the information in this presentation or any decision or consequence based on the use of it. PwC will not be liable for any damages arising from the use of the information contained in this presentation. The information contained in this presentation is of a general nature and is solely for guidance on matters of general interest. This presentation is not a substitute for professional advice on any particular matter. No reader should act on the basis of any matter contained in this publication without considering appropriate professional advice.

The contents of all datasets used in this workshop are fictional, if not stated otherwise. Any resemblance to actual persons, places, organisations or products is purely coincidental.