



Qlik GeoAnalytics® workshop and QlikView®

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Introduction

Qlik GeoAnalytics is the latest addition to the Qlik product family. With Qlik GeoAnalytics there is both a set of extensions for visualization as well as a Connector with different geographical operations.

Qlik GeoAnalytics delivers:

- A map layer with different configurations
- Bubble-, Area-, Chart-, Heatmap-layer
- Location lookup on the fly without coordinates
- Geodata-layer connecting to external geodata sources, Esri among others
- All in a user-driven, drag-and-drop creation
- A powerful set of operations in the Qlik GeoAnalytics Connector such as;
 - Aggregating operations
 - Geometric operations
 - Route operations
 - Load operations of geographical data
- All Connector operations in an easy to use wizard-interface

In this workshop, we will use QlikView but all the exercises can also be accomplished with Qlik Sense. Qlik Sense, the next-generation self-service data visualization application that empowers people to easily create a range of flexible, interactive visualizations that drive exploration and discovery using one's intuition. With the proven QIX Associative Data Indexing engine at its core, QlikView and Sense delivers:

- Control - Create business driven data discoveries with guided analysis paths that are highly customizable and tightly governed.
- Guided Analytics - Beautiful, controlled analytic experiences guide employees toward discovering insights and making meaningful decisions
- Secure - Top-down control of analytics apps, permissions and data management
- Centralized Apps - Granular control of dashboards, layouts and design
- Flexibility - Build the exact tools you need for your organization and teams
- Customizable - Develop custom apps with QlikView scripting and extend development with QlikView Workbench
- Combinable - Integrate QlikView into your business applications and system management software with extensive APIs
- Global Search - Use natural search to navigate complex information to accelerate discovery
- Consistency - Provide one set of data and apps for use across your entire organization
- Data Integration - Unify data sources for a complete view of information, centrally managed data and apps make it easier to discover insights
- Advanced reporting - Create and distribute consistent reports and templates, plus embed them in Microsoft Office documents with Qlik® NPrinting
- Enterprise scalability - The advantages of guided analytics with secure, enterprise-level governance of data and analytics

- Self-service data preparation capabilities
- A cutting-edge self-service visualization and discovery experience
- Associative exploration and smart search
- Advanced data visualization
- User-driven, drag-and-drop creation
- Collaboration and storytelling
- Unsurpassed mobility
- Best-of-breed custom development
- Powerful data integration
- Governed enterprise capabilities and performance

Goals

This workshop is designed to introduce you to Qlik GeoAnalytics and provide step-by-step introductions on how to build your first QlikView application with GeoAnalytics.

Learn how to create a map application in QlikView using Qlik GeoAnalytics. Perform location lookups on the fly and create several types of layers, such as bubble-, area-, chart-, heatmap- and geodata-layer.

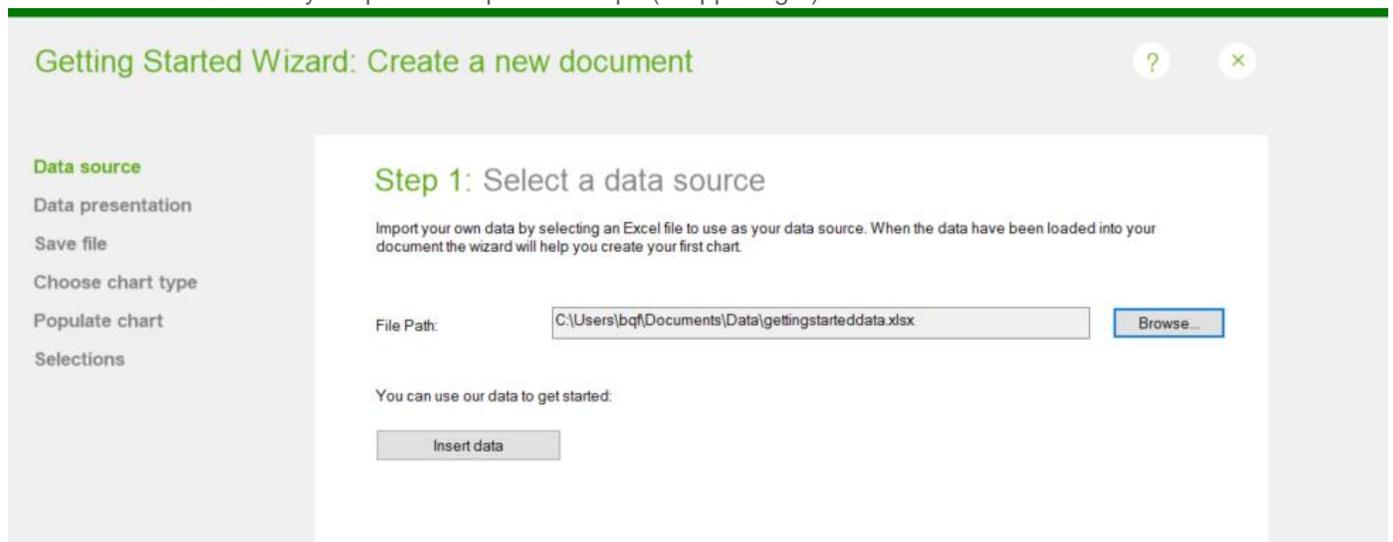
We will also learn how to use the GeoAnalytics Connector operations for powerful geospatial calculations and data load options.

Exercise 1

In this first exercise, the aim is to build a QlikView application and create different visualizations using Qlik GeoAnalytics. Location lookup on the fly will be used to get an overview based on city and country. Throughout the exercise, more visualizations will be added with the aim to get an overview and answer business questions in the data.

Create a New QlikView Application and Add data

1. Open QlikView and Create a new application (ctrl+N)
2. Step 1 – Browse to the file gettingstarteddata.xlsx and click next step.
3. The data is structured so the column headers can be used as is, click next step.
4. Give the app a name, like gettingstarted_initials and press save and next step.
5. During the next steps, there is a wizard style interface on how to choose different graphs and populate these. We will focus on the Geoanalytics part so skip these steps (X upper right).



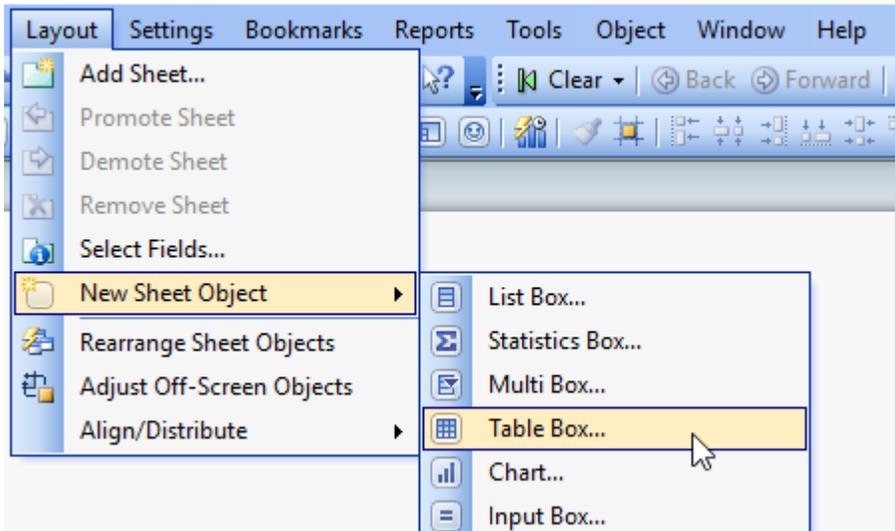
Check the loaded data

Before creating any visuals, check the loaded data by looking at the table viewer (ctrl+T), found in the *File* menu or by selecting the icon.



Add a table in the app

1. Add a table box with the following columns:



Fields Displayed in Tablebox

CategoryID
CategoryName
City
Country
Customer
CustomerID
ProductID
ProductName
Sales

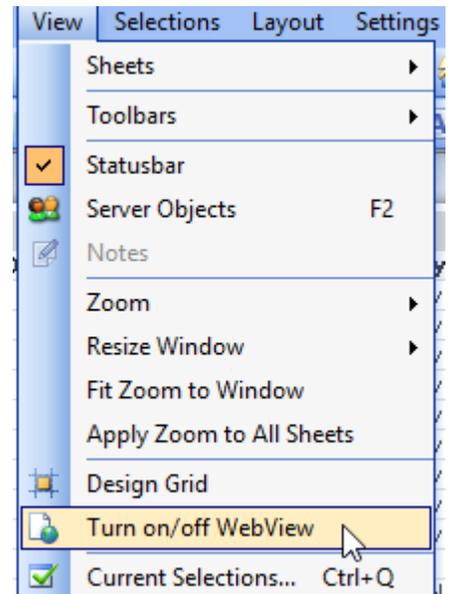
2. Apply and drag the table to the upper left corner.

CategoryID	CategoryName	City	Country	Customer	CustomerID	ProductID	ProductName	Sales
1	Men's Clothes	Aachen	Germany	Gluderstedt	17	2	Mr X Trousers	719.25
1	Men's Clothes	Aachen	Germany	Gluderstedt	17	2	Mr X Trousers	1201.2
1	Men's Clothes	Aachen	Germany	Gluderstedt	17	5	O-Man Underwear	478.14
1	Men's Clothes	Aachen	Germany	Gluderstedt	17	11	Desperado Jeans	584.2
1	Men's Clothes	Aachen	Germany	Gluderstedt	17	70	US-Master Jeans	212.52
1	Men's Clothes	Aachen	Germany	Gluderstedt	17	70	US-Master Jeans	278.91
1	Men's Clothes	Aachen	Germany	Gluderstedt	17	71	Atles Lussekofta	617.4
1	Men's Clothes	Aachen	Germany	Gluderstedt	17	75	Bow tie	96.72
1	Men's Clothes	Aachen	Germany	Gluderstedt	17	75	Bow tie	1064.7
1	Men's Clothes	Albuquerque	USA	X-Site	65	5	O-Man Underwear	80.352
1	Men's Clothes	Barquisimeto	Venezuela	Los Vatos Locos	46	11	Desperado Jeans	319.44

Start using the GeoAnalytics Extensions and add a Map-, Bubble- and Area-layer

The data needed for this exercise has now been loaded and a table with the fields that are going to be used have been added. Now let's drag in some GeoAnalytics extension objects using the loaded data.

1. First make sure WebView is turned on via the *View Menu Turn on/off WebView*.



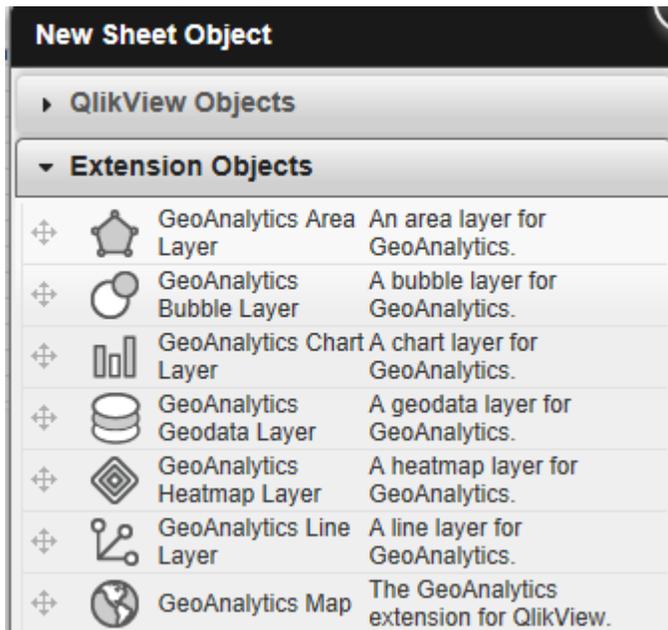
Open the Qlik GeoAnalytics Extension objects

2. Right click on the *Workspace* and open + New Sheet Object.



Add a Map-layer

3. The GeoAnalytics objects are found under Extension Objects.



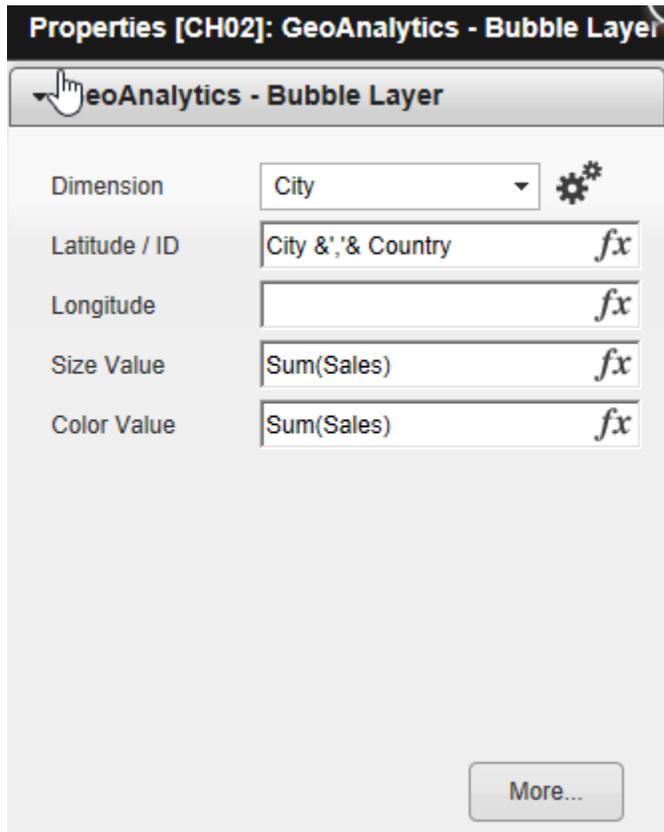
Drag and Place a GeoAnalytics Map layer to your workspace. Preferably use up to 2/3 of the workspace/grid and save 1/3 to the right for other layers.

Tip! Always start with the map objects, by doing so the other objects will automatically display on the map.

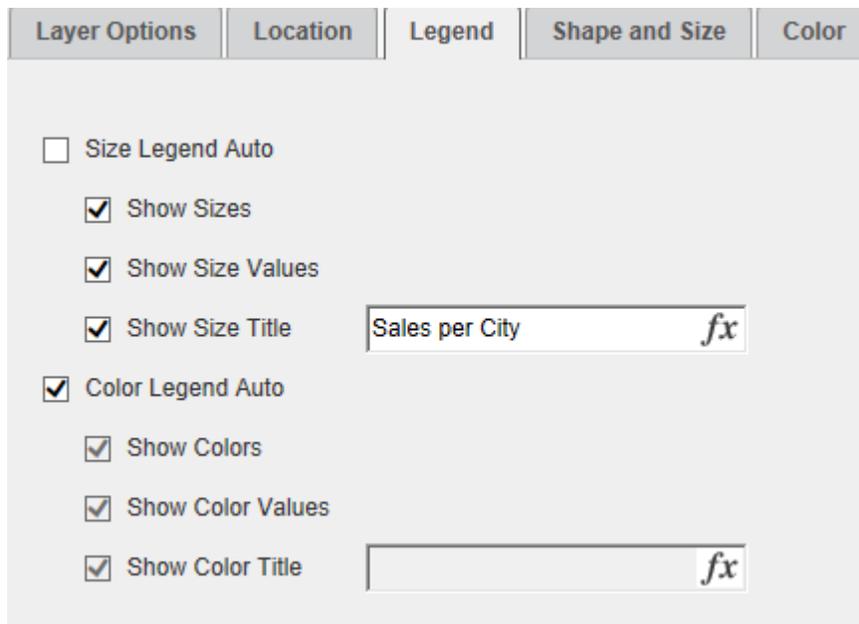
Add a Bubble-layer

4. Add and drag a Bubble layer to the upper right of the workspace. Set the properties of the layer, by right clicking on the Bubble layer and select *Properties*. The *Dimension* is **City** and the *Latitude/ID*: **City & ' & Country**. The reason for also adding country to the *Latitude/ID* is to increase the accuracy of the on the fly location service, meaning cities with the same name will appear in the correct country. By adding **Sum(Sales)** as the *Size Value*,

the size of the bubbles will reflect the sales per city. By also adding Sum(Sales) as the *Color Value* the color will also reflect the sum of sales.



- Now it is time to work with the Appearance of the Bubble layer, by clicking the **More** button.
- Add Legend Title: **Sales per City**



- Change Shape and Size to: **Triangle**
- And change the colors to custom, unselect **Auto** and choose: **Reverse**

Layer Options	Location	Legend	Shape and Size
Shape	Triangles		
Min Radius	5		
Max Radius	20		
Min Size Value			
Max Size Value			

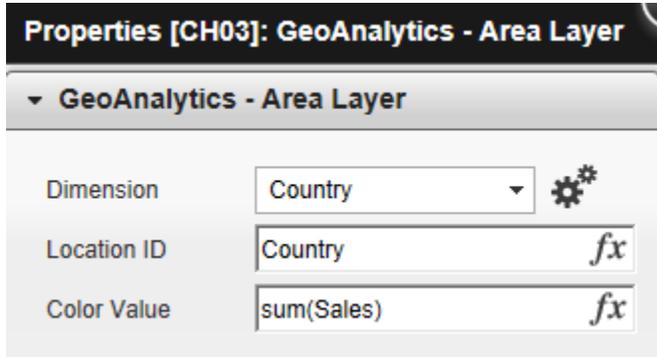
Layer Options	Location	Legend	Shape and Size	Color
<input type="checkbox"/> Auto				
Color Mode	By Measure			
Color Scheme	Sequential Gradient			
<input checked="" type="checkbox"/> Reverse				

- Customize the Info Bubble to show City and Sum of Sales.

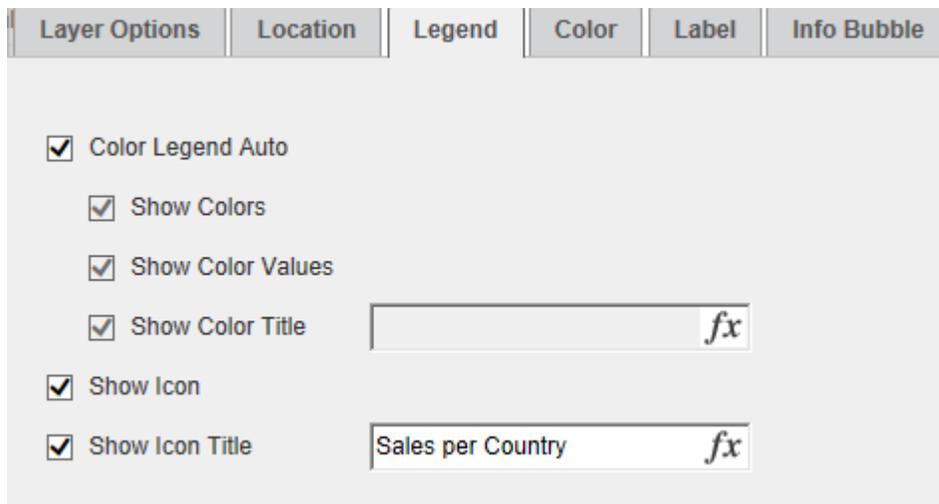
Layer Options	Location	Legend	Shape and Size	Color	Label	Info Bubble
<input checked="" type="checkbox"/> Show Info Bubble						
<input type="checkbox"/> Auto						
Info Bubble	City &, '& Sum(Sales) <i>fx</i>					
<input checked="" type="checkbox"/> Format Numbers						
<input checked="" type="checkbox"/> Auto-Format Numbers						
Format Numbers List						

Add an Area-layer

6. Add the second layer, an Area layer by dragging the GeoAnalytics Area Layer from Extensions Objects to the worksheet below the Bubble Layer. For the Area layer, type **Country** as *Dimension* and *Location ID* and add *Color Value* as **sum(Sales)**.



7. Thereafter click the **More** button.
- Add Legend Title: **Sales per Country**



- The color of the layer can also be customized by an expression. Let's try that for the Area Layer! Make sure that Color is *By Expression*. The aim is to have all Countries with a Sum of Sales greater than 175.000 in green, the ones under 25.000 in red and the rest in yellow. How this can be achieved have a look at the second screen shot below.

- Last transparency is added for the Area Layer, further down the under Color. Set the value to 50.

Layer Options | Location | Legend | Color | Label

Auto

Color Mode: **By Expression**

Color Expression: `if(Sum(Sales)<'175000' and St` *fx*

Reverse

Range Auto

Range Min: 0

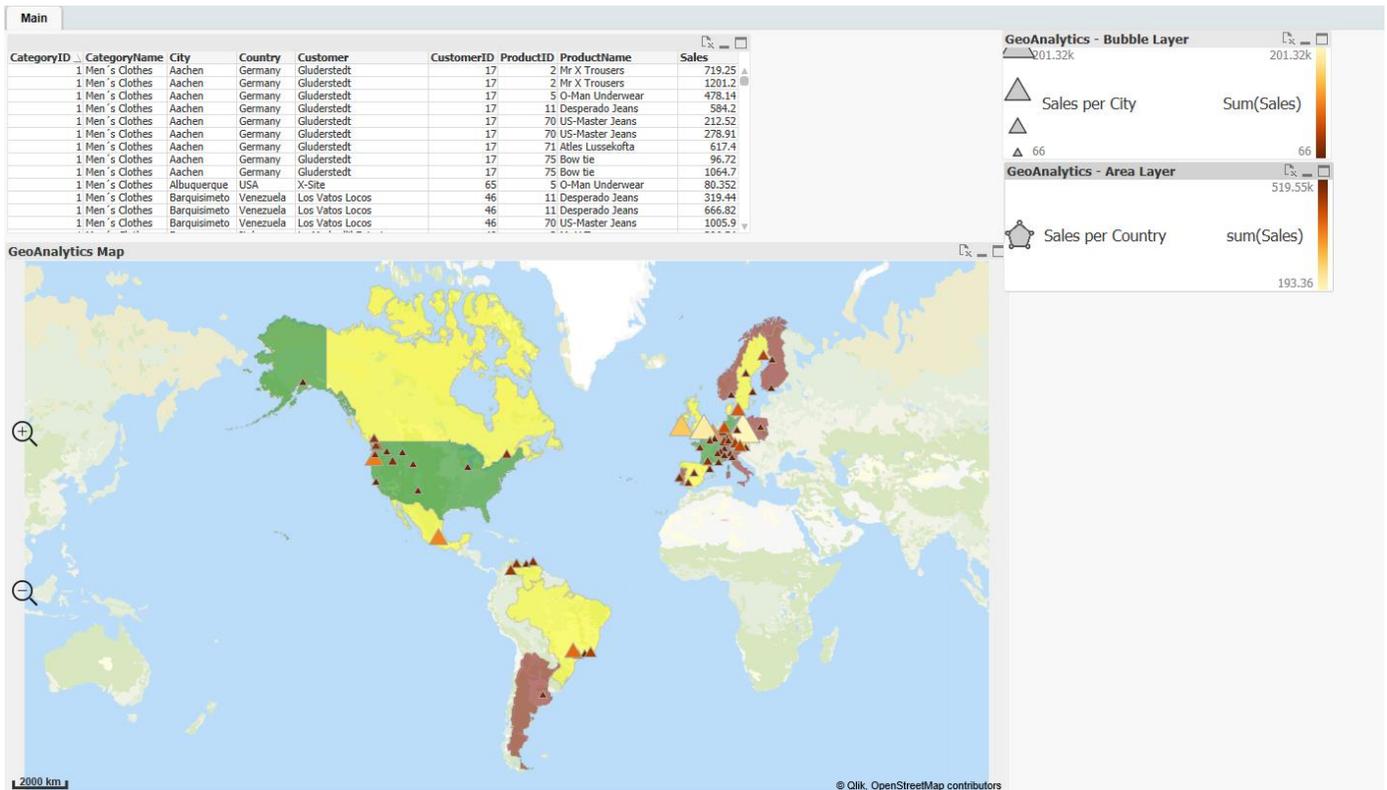
Range Max: 10

Transparency (0-100): 50

Outline Color: #aaaaaa

```
if(Sum(Sales)<'175000' and Sum(Sales)>'25000', Yellow(),
if(Sum(Sales)<'25000', Red(),
if(Sum(Sales)>'175000', Green()))
```

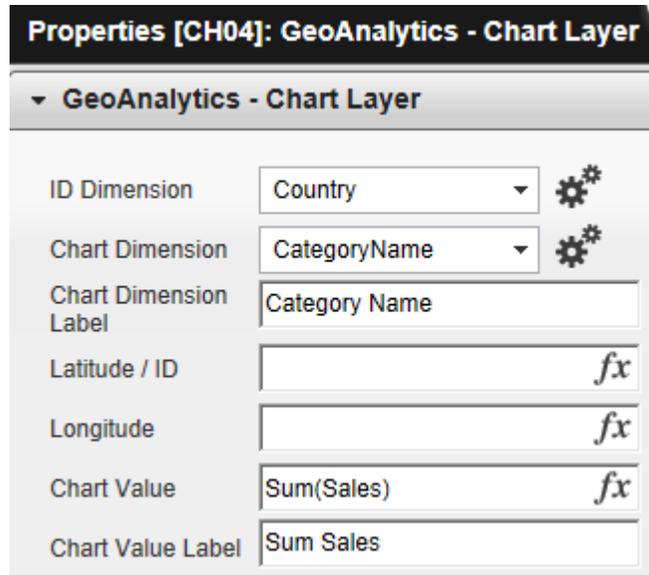
8. Close the Properties dialogue, and the result shall be something that looks like this:



Add a Chart-layer

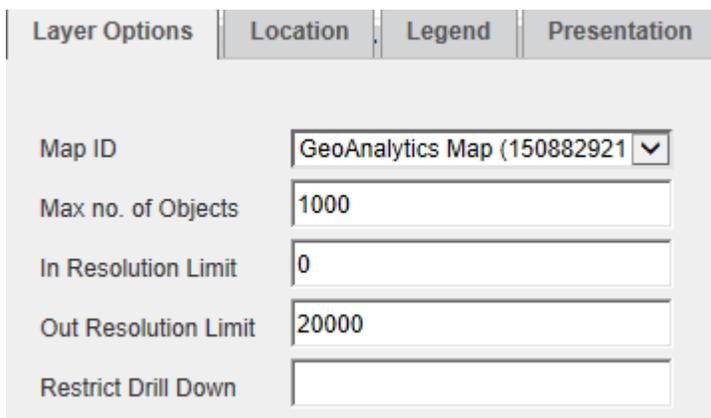
We have now created a sheet with a Map, a Bubble and an Area layer and shall now add a Chart-layer.

9. Add the Chart layer, by dragging the GeoAnalytics Chart Layer from Extensions Objects to the worksheet below the Area Layer. For the Chart layer, select **Country** as *ID Dimension* and **CategoryName** as *Chart Dimension*. The *Chart Value* is once again **Sum(Sales)**. For presentation purposes also add **Category Name** as *Chart Dimension label* and **Sum Sales** as *Chart Value Label*.



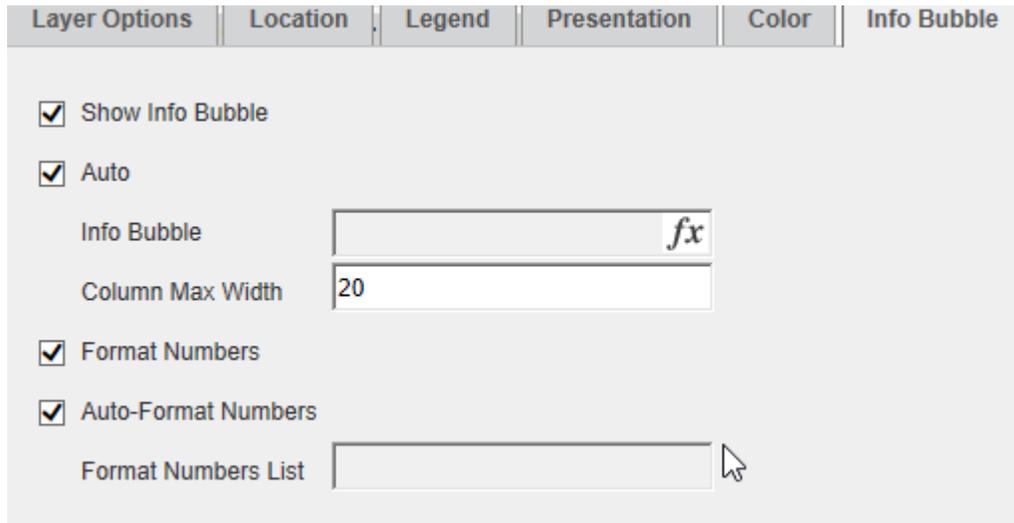
Properties [CH04]: GeoAnalytics - Chart Layer	
▼ GeoAnalytics - Chart Layer	
ID Dimension	Country 
Chart Dimension	CategoryName 
Chart Dimension Label	Category Name
Latitude / ID	<input type="text" value="fx"/>
Longitude	<input type="text" value="fx"/>
Chart Value	Sum(Sales) <input type="text" value="fx"/>
Chart Value Label	Sum Sales

10. In this part, we will learn how to only display an GeoAnalytics Object at a predefined zoom level. Click on **More..** and go to *Layer Options* and change the *Out Resolution Limit* to **20000**.

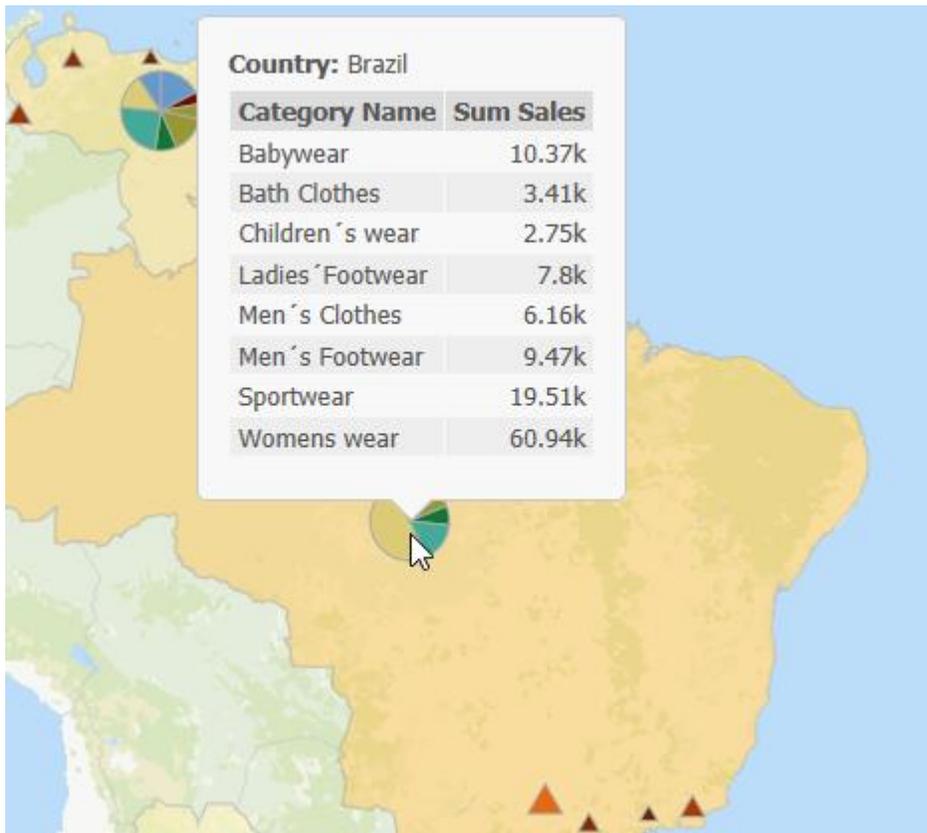


Layer Options	Location	Legend	Presentation
Map ID	GeoAnalytics Map (150882921) ▼		
Max no. of Objects	<input type="text" value="1000"/>		
In Resolution Limit	<input type="text" value="0"/>		
Out Resolution Limit	<input type="text" value="20000"/>		
Restrict Drill Down	<input type="text"/>		

Also format the numbers in the **Info Bubble** by Select the checkbox *Format Numbers*.



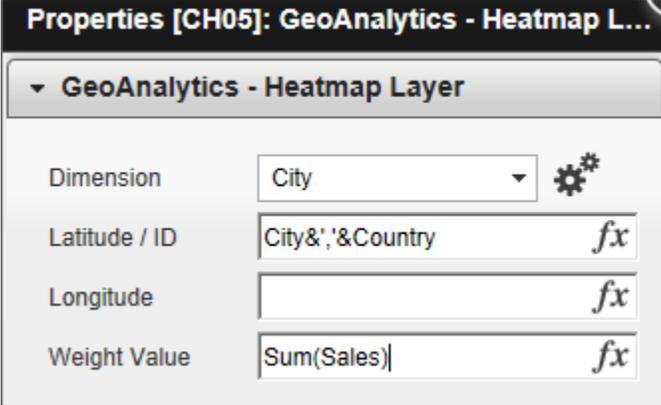
11. The Chart layer shall now only be visible when zooming in. Close the Chart Layer Properties Dialogue and try it out!



Add a Heatmap-layer

Now, it is time to add a Heatmap-layer!

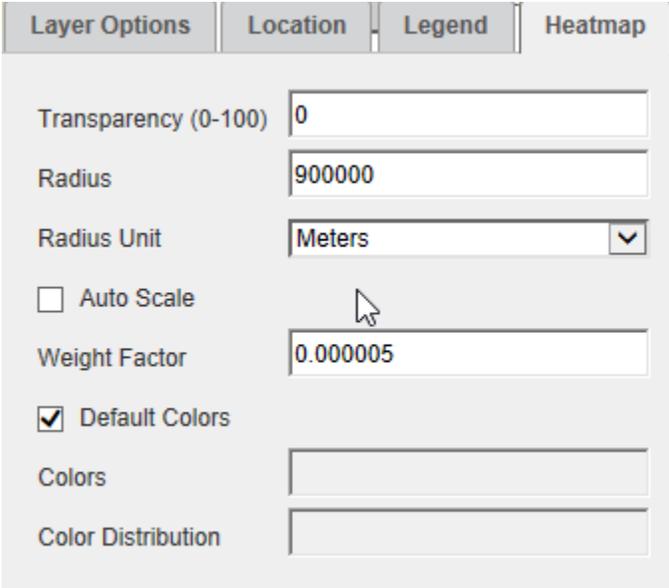
12. Once again drag an Extension Object to the workspace, this time the GeoAnalytics Heatmap-layer. The dimension shall be **City** and the *Latitude ID*, *Weight Value*: **City &'&Country** and **Sum(Sales)**.



The screenshot shows the 'Properties [CH05]: GeoAnalytics - Heatmap L...' window. It features a dropdown menu for 'GeoAnalytics - Heatmap Layer'. Below this, there are four rows of configuration options:

Property	Value	Icon
Dimension	City	⚙️
Latitude / ID	City&'&Country	fx
Longitude		fx
Weight Value	Sum(Sales)	fx

13. Adjust the appearance of the Heatmap, so press **More..** and select *HeatMap*. To have a heatmap that doesn't change when zooming in the map change *Radius Unit* to **Meters** instead of **Pixels**. Then choose a radius for the Heatmap. To find your best choice, play around, but 900.000 meters is a value that works in this case with the distance between cities in this dataset.
 - Set the Scale to Custom and the weight factor to 0.000005.



The screenshot shows the 'Heatmap' configuration panel with the following settings:

Property	Value
Transparency (0-100)	0
Radius	900000
Radius Unit	Meters
<input type="checkbox"/> Auto Scale	
Weight Factor	0.000005
<input checked="" type="checkbox"/> Default Colors	
Colors	
Color Distribution	

Add another Bubble-layer

14. Qlik handles multiple layers so why not add another Bubble layer, without having Sum(Sales) as the measure for Size. All cities will for this layer be displayed equally large and this adds to the Heatmap layer understanding. So now add another Bubble layer with the *Dimension City* and the *Latitude ID* with the expression **City &'& Country**.

Properties [CH06]: GeoAnalytics - Bubble Layer

▼ GeoAnalytics - Bubble Layer

Dimension: City

Latitude / ID: City &'& Country *fx*

Longitude: *fx*

Size Value: *fx*

Color Value: *fx*

15. Change the Shape and Size by clicking **More..**. Set the Radius value to 3 under *Shape and Size*. The Color is set under *Color* by unselecting *Auto* and choose *Single Color* and why not set the color to **Black**.

Layer Options | Location | Legend | **Shape and Size**

Shape: Bubbles

Min Radius: 3

Max Radius: 3

Min Size Value:

Max Size Value:

Layer Options | Location | Legend | Shape and Size | **Color**

Auto

Color Mode: Single Color

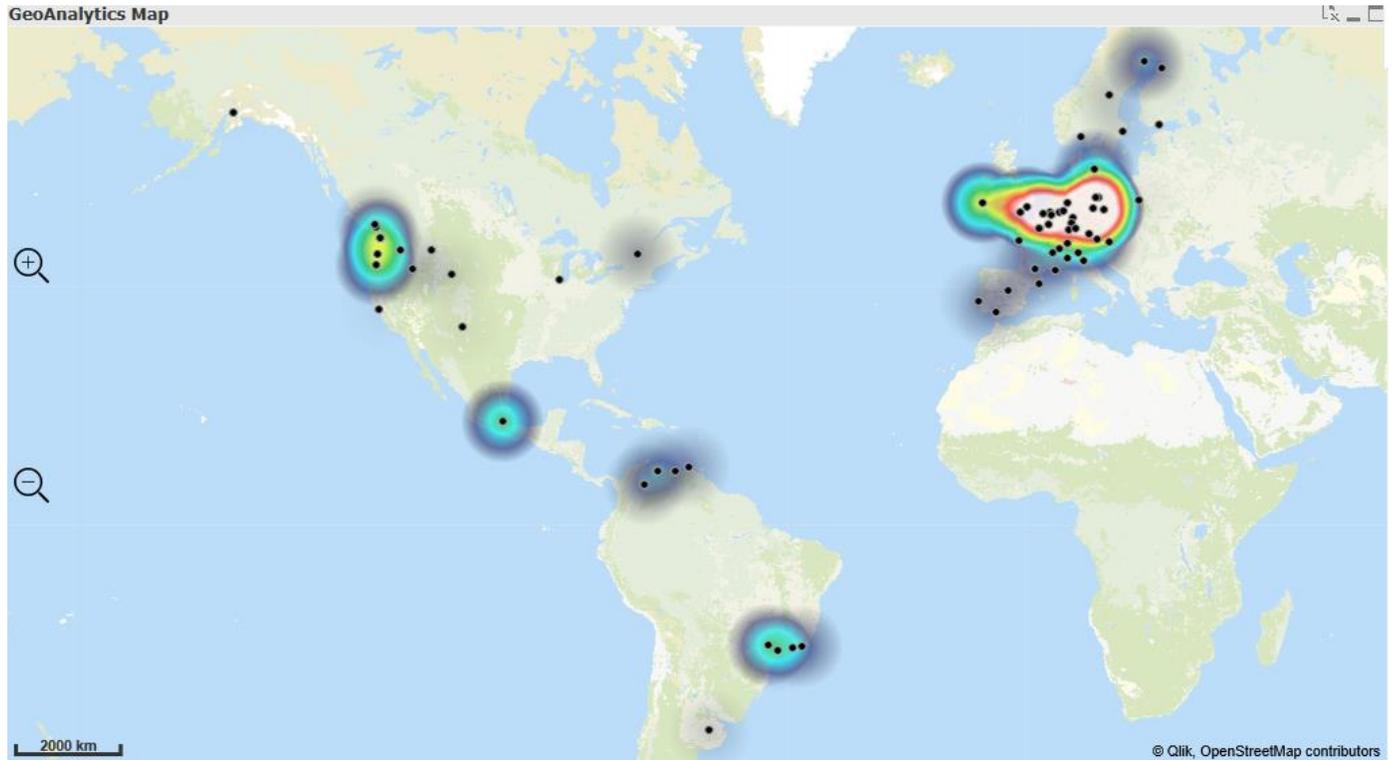
Color Scheme: Black

Reverse

16. Close the settings dialogue.

To only display the HeatMap- and the latest Bubble-layer on the map, the other layers can be turned off by left clicking on the layers and deselect **Visible**.

17. The Heatmap and bubble layer now look like this!



Add a GeoData-layer

It is time to connect to an external data source, in this case a background WMS map layer, using the Extension layer GeoData.

21. Add the Geodata layer to the workspace. The WMS Service URL is:

https://nowcoast.noaa.gov/arcgis/services/nowcoast/radar_meteo_imagery_nexrad_time/MapServer/WmsServer?request=GetMap&service=WMS&layers=1&styles=&format=image/png&bgcolor=0xFFFFFF&transparent=true

It is preferably copied from above or from the example app called "Ex1_Ex.qvw". Open the app, select the properties in the Geodata layer and copy the URL.

Exercise 2

In the second exercise, it is time to start using the GeoAnalytics Connector to get an introduction to some of the operations. The Connector operations are powerful finding geographical relations and insights in the data, often adding data to the data model. The result from this exercise shall be lines between cities in the USA and the closest airports. In addition, we shall add Travel Areas to the visualization. The dataset we will be working with is called USACities.qvd.

Add data to the App

Before you can create visuals for Exercise 2, you will need to provide QlikView with more data. Start by open *Edit Script*.

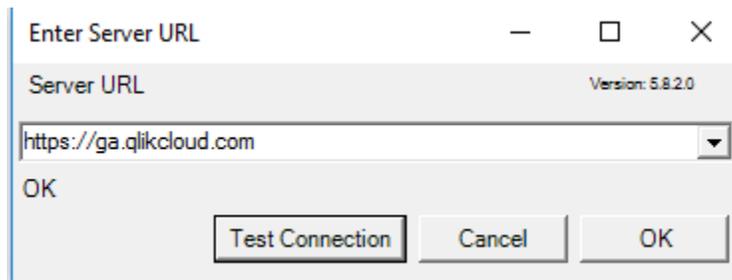
Add data

1. From the Menu button select *Table Files* open the USACities.qvd This opens the *File Wizard*. Add the link to the script by clicking *Finish*.
2. To load the data, press the button *Reload*. To investigate what has been loaded and check the result open the *Source Table View*.

Create the first GeoAnalytics Connector operation “Closest”

Now it is time to start using the Connector to find the closest airports to all loaded cities in the US.

3. In the *Edit Script* menu choose the *Database IdevioGeoAnalyticsConnector.exe* and press the button *Connect*, *Test Connection* and *Ok*. This will create an auto generated script connecting to the Connector.



4. With the connection established it is time to Select Data for the Connector operation by pressing the button and *Select Data*. The dialogue of the Connector is opened again, but just press *Test Connection* and *Ok* and now choose operation *Closest*.

5. Select the operation Closest and fill in the parameters as below:

The screenshot shows the 'GeoAnalytics Connector' dialog box with the following settings:

- Choose Operation:** Closest (dropdown menu)
- Parameters:**
 - Distance unit:** Meters (dropdown menu)
 - Maximum distance (cost) between geo:** 50000 (text input)
 - Distance type:** Bird (dropdown menu)
 - Closest count:** 3 (text input)
- Dataset | dataset1 - Dataset containing geometries to measure from:**
 - Dataset Type:** Loaded table (dropdown menu)
 - Dataset Name:** closest (text input)
 - Table Name:** USACities (text input)
 - Table Fields (key.geometry,...)*:** UsCity (text input)
 - Geometry Type:** Location Named Point (dropdown menu)
 - Only load distinct:** Yes (dropdown menu)
 - Location ID Suffix:** US (text input)
 - CRS:** Auto (text input)
- Dataset | dataset2 - Dataset containing geometries to measure to:**
 - Dataset Type:** Standard areas and points (dropdown menu)
 - Dataset Name:** airports (text input)
 - Geometry kind:** Point (dropdown menu)
 - Type of data:** Airport Code IATA (dropdown menu)
 - Country code(s):** US (text input)
 - Name of service:** default (text input)

Buttons at the bottom: Cancel, Clear, Back, Next, OK.

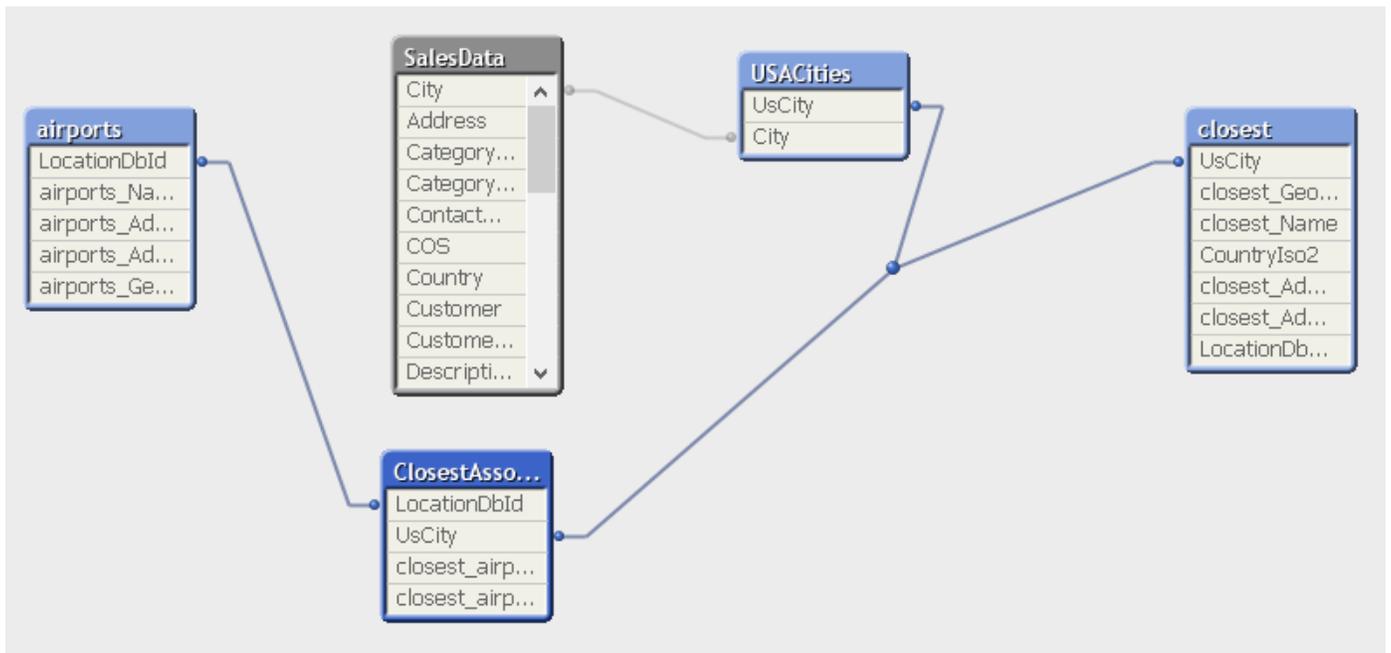
The settings will give the closest airports to the loaded USACities. The first section are operation parameters, and we want to find the closest airports within 50.000 meters, using Bird distance and maximum 3 per city.

The next section to be defined is the Dataset that contains our geometries to measure from, in our case table USACities with the field UsCity. As there are no coordinates for the cities, apply Geometry type *Location Named Point*, which does a look up to the location service. Also limit the search to US, by adding Location ID Suffix.

Finally, define the dataset containing the geometries to measure to. Use Airports with code IATA from Standard areas and points, using the location service (cloud based). Also limit the selection to US.

6. Select all data except CountryISO and LocationDBType under Table airports. This to avoid synthetic keys.
7. Then run the script by pressing *Reload*.
8. Look at the new tables added to your data model by clicking on the *Table Viewer*.

The data model shall now look like this:



Add a new Sheet to the Application

9. Add a new Sheet for the new visualizations.



Add a Map-, Line and two Bubble-layers to the new Sheet

10. Select the new sheet, right click and add New Sheet Objects:



- Add a Map Layer (under Custom Objects/Extensions)
- Then drag a Line layer to the sheet. The line shall be between the loaded US cities and the airports generated by the Closest operation.

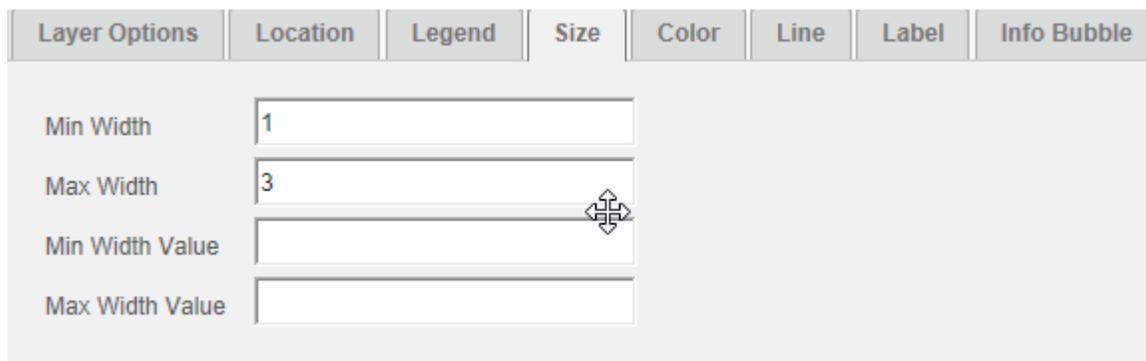
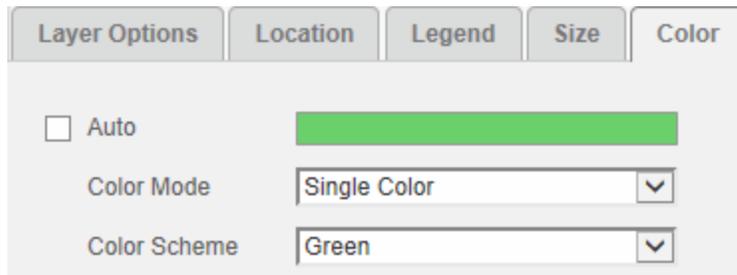
The *Dimension*: closest_airports_RelationId.

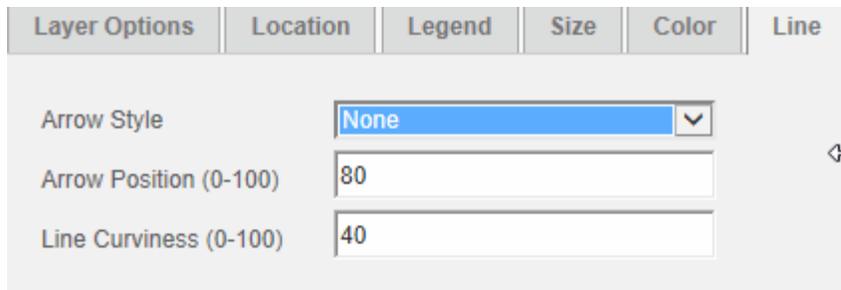
The *Latitude / ID 1*: closest_Geometry

The *Longitude / ID 2*: airports_Geometry

Use the geometries added to the data model. Width can be left out in this step.

11. Working with the appearance, select Appearance for the line layer. The task is to set the line width to max 3 with the color to green, and add some curviness to the line.





12. Finally customize the info bubble to show the name of City and airport hovering over the line.



13. As the next step add an Info Bubble to the Line layer with text name of city and name of airport. Enable Custom under Info Bubble and add the following script as expression: UsCity & ',' &airports_Name.

14. Finally, add two bubble layers for Cities and Airports, by dragging two more Bubble layers to the work-space. The bubbles shall be of size 3 and with different colors, and showing the name of the city/airport. If needed have a look from bullet 5 in Exercise 1. Below the dimensions and measures to use.

I: Bubble layer City

- *Dimension*: UsCity

- *Latitude / ID*: City & ',' & Country.

Click **More...** and set size to 3 and *Color* to Grey. Edit the *Info Bubble* to Custom: City

Now the Cities will be displayed with Name.

II. Bubble layer Airport

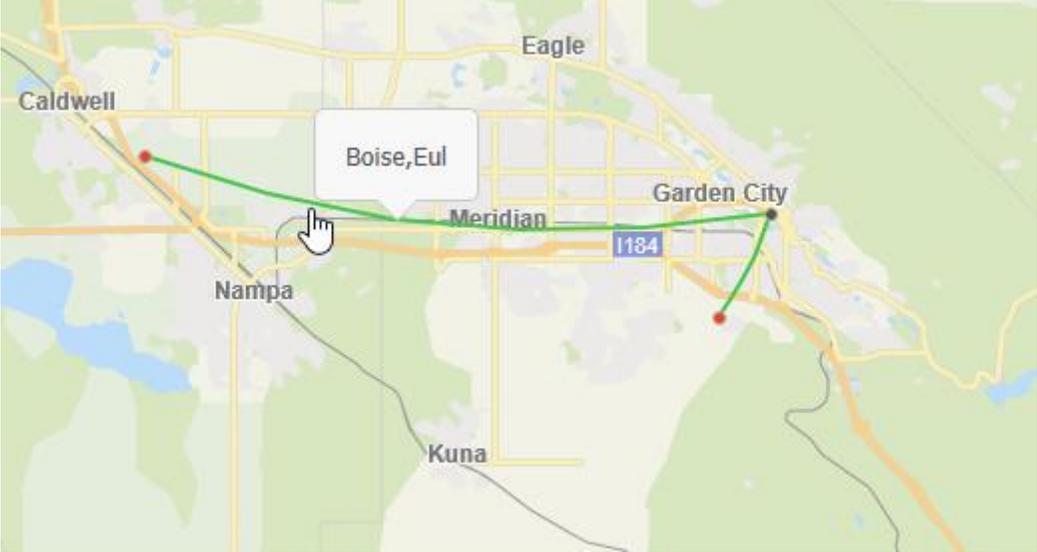
- *Dimension*: closest_airports_RelationId

- *Location, Size add measure*: airports_Geometry

Click **More...** and set the size to 3.

Add Info Bubble to Custom: 'IATA: ' &airports_Name

Now the “closest” airports are visualized together with the cities and lines in between. When hovering over a line or a bubble layer the Info Bubble name will show up.



Add Travel Areas with the GeoAnalytics Connector

15. By using the Connector operation TravelAreas custom travel areas can easily be created with different cost values and transportation modes. In this part create travel areas of 50 minutes' drive time around the loaded US cities. The result from this Connector operation are create polygons/areas.
16. Reuse the same GeoAnalytics connector as for the Closest operation opening the *Edit Script* and click on *Select Data*. A good thing is to more Tabs when using a many Connector operations.

The parameters to fill in are:

GeoAnalytics Connector

Choose Operation: TravelAreas [Help](#)

Parameters

Cost Value: 50

Cost Field:

Cost Unit: Minutes

Transportation: Car

Dataset | dataset - Origins

Dataset Type: Loaded table

Dataset Name: ta

Table Name: USACities

Table Fields (key,geometry,...)*: UsCity

Geometry Type: Location Named Point

Only load distinct: Yes

Location ID Suffix: US

CRS: Auto

Buttons: Cancel, Clear, Back, Next, OK

17. Load the following data – uncheck CountryISO and LocationDBType under Table ta.

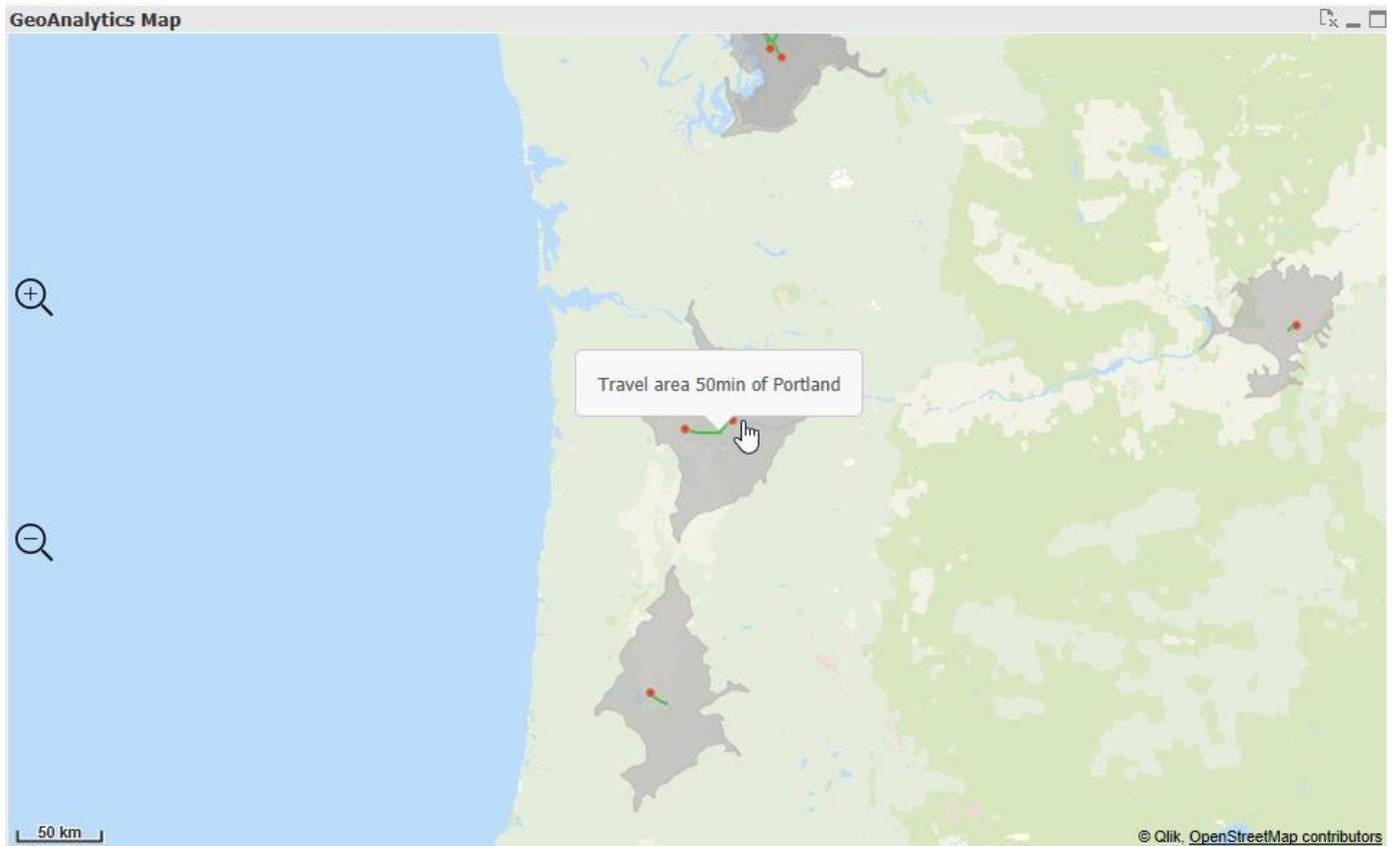
After Script has been generated press Reload!

Add an Area-layer with Travel Areas

18. Now it is time add a visualization of our Travel areas. Go to the Sheet, and drag an Area layer to the Worksheet.
 - Dimension: ta_TravelArea
 - LocationID add measure: ta_NameSet Location Options/Location Source to: Dimension

19. Appearance, add a transparent single color with an Info Bubble displaying: **Travel area 50 min of City** by adding a custom *Info Bubble* 'Travel area 50 min of '&ta_Name

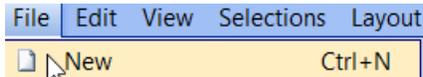
This completes Exercise 2 – well done! Maybe it looks like this when zooming in.



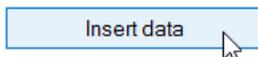
Extra assignment #1 Dissolve countries into continents

The main goal in this exercise is to create new custom regions out of standard regions. In this exercise, we're going to create continents by dissolving world countries using a definition table. This is a common operation creating own custom sales, market or production regions out of loaded geometries or by using the geometry service. With the geometry service, there is no need to load any geometries.

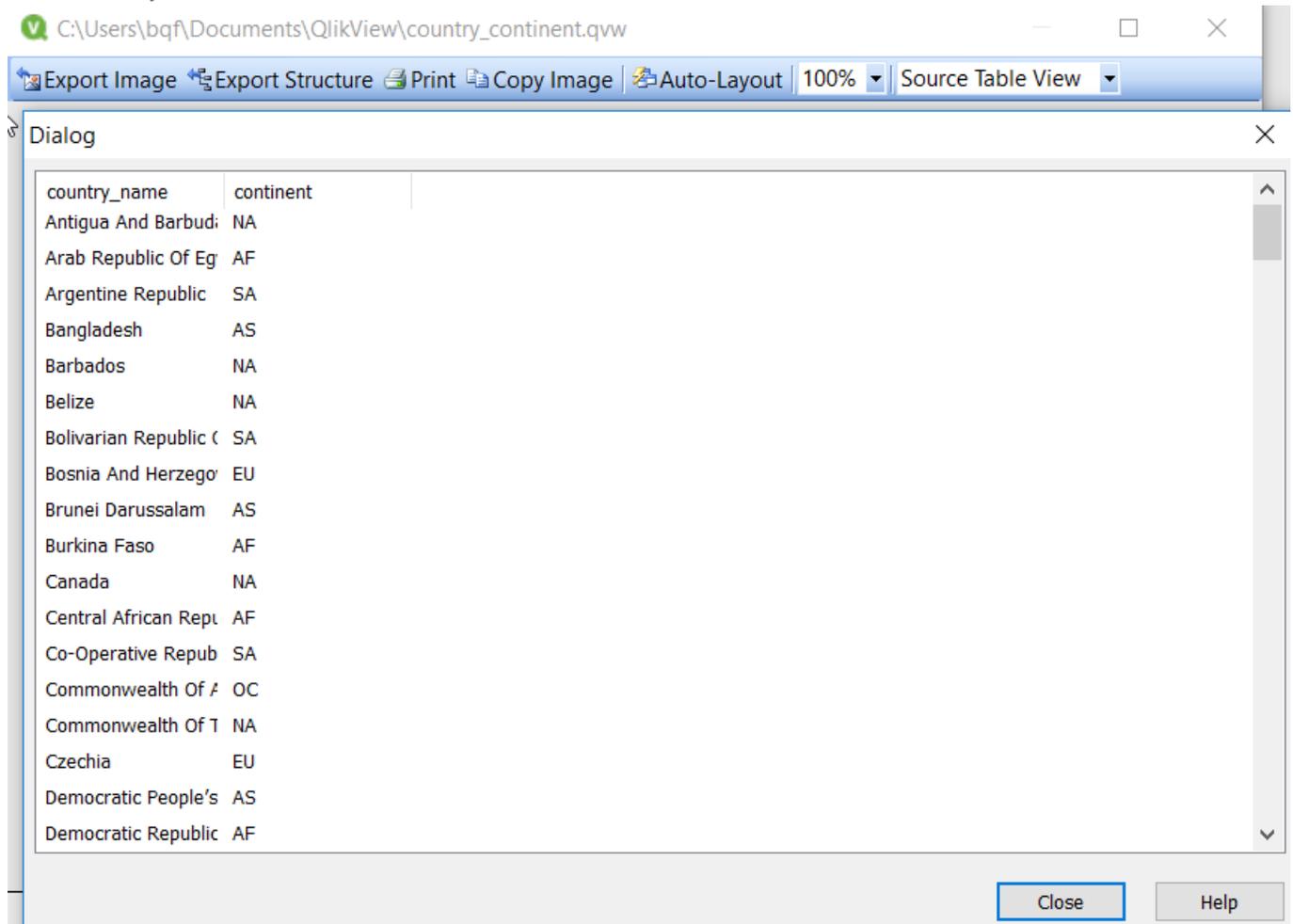
1. First start by creating a New App and load the data countryxcontinent.xlsx



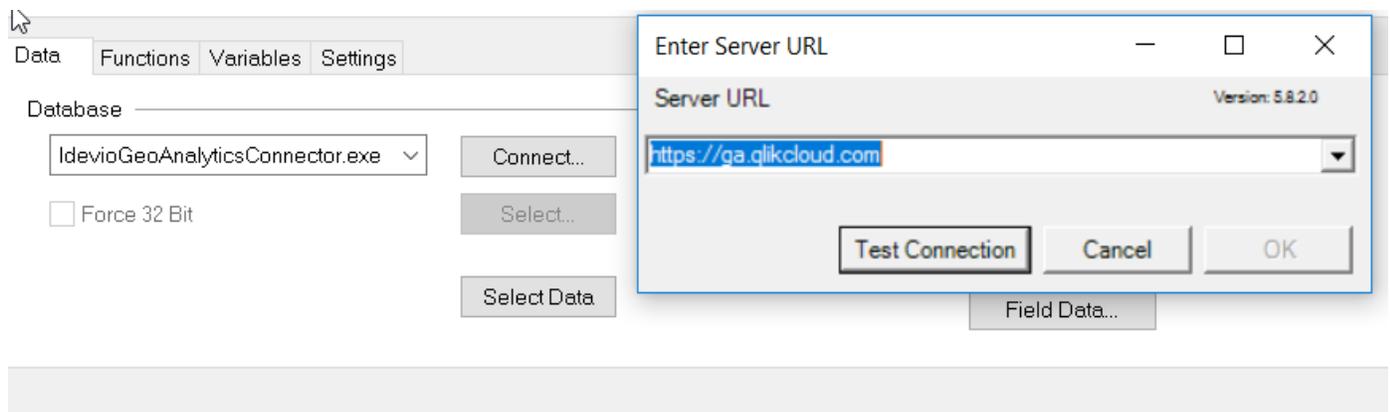
You can use our data to get started:



2. Now *Edit Script* (ctrl+E) and have a look at the Source Table View(Dialog). The table shall consist of two different fields, country_name and continent.

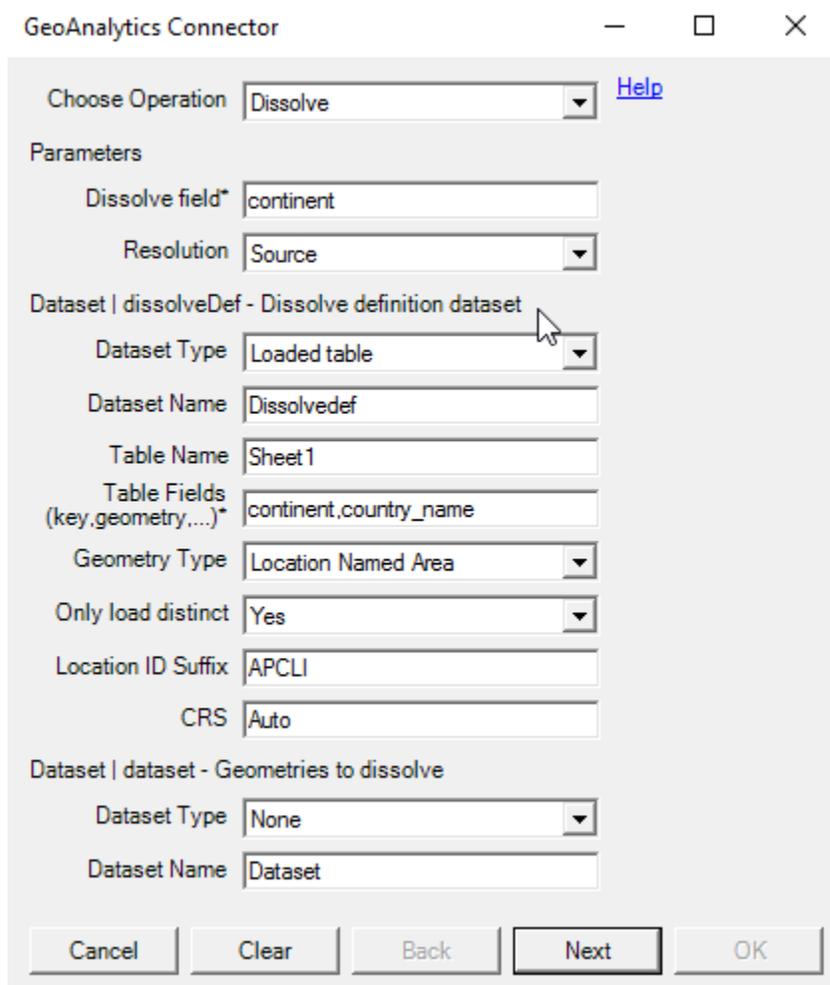


3. Create a connection to the Qlik GeoAnalytics Connector, by selecting the Connector, test the Connection and press thereafter ok.

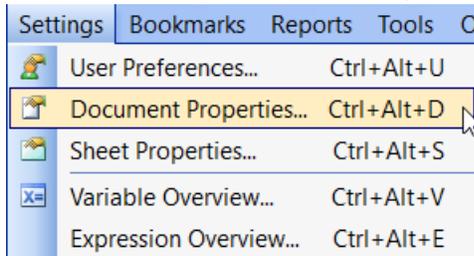


4. In the next step, *Select Data* for the Connector and choose the Operation Dissolve.
5. The Dissolve operation shall create regions out of countries
Fill in the values
 - a. Dissolve field: “continent”, the column name in the .xlsx file that you want to use for the dissolve operation
 - b. Resolution: “Source”, as no simplification of the areas are necessary.
 - c. Dataset Type: “Loaded table”
 - d. Name: Chose any name, for example “dissolvedef”
 - e. Table name: “Sheet1” (created from the sheet name from the .xlsx file)
 - f. Table fields: “continent, country_name” The first position is the dissolve field used and the 2nd the geometry, in this case country names.
 - g. Geometry type: “Location named area”, since the built-in Location service is used finding out the geometries of the countries.
 - h. Only distinct “Yes”
 - i. Location ID Suffix: “APCLI” We want to help the Location service a little bit by adding a suffix telling the service that it is countries in the table. For more suffixes, see here http://bi.idevio.com/wp-content/qlik/qliksense/releases/IdevioMapsForQlikSense-5.8.0/geometry_service.html
 - j. CRS: Coordinate reference system, in this case: Use “Auto”

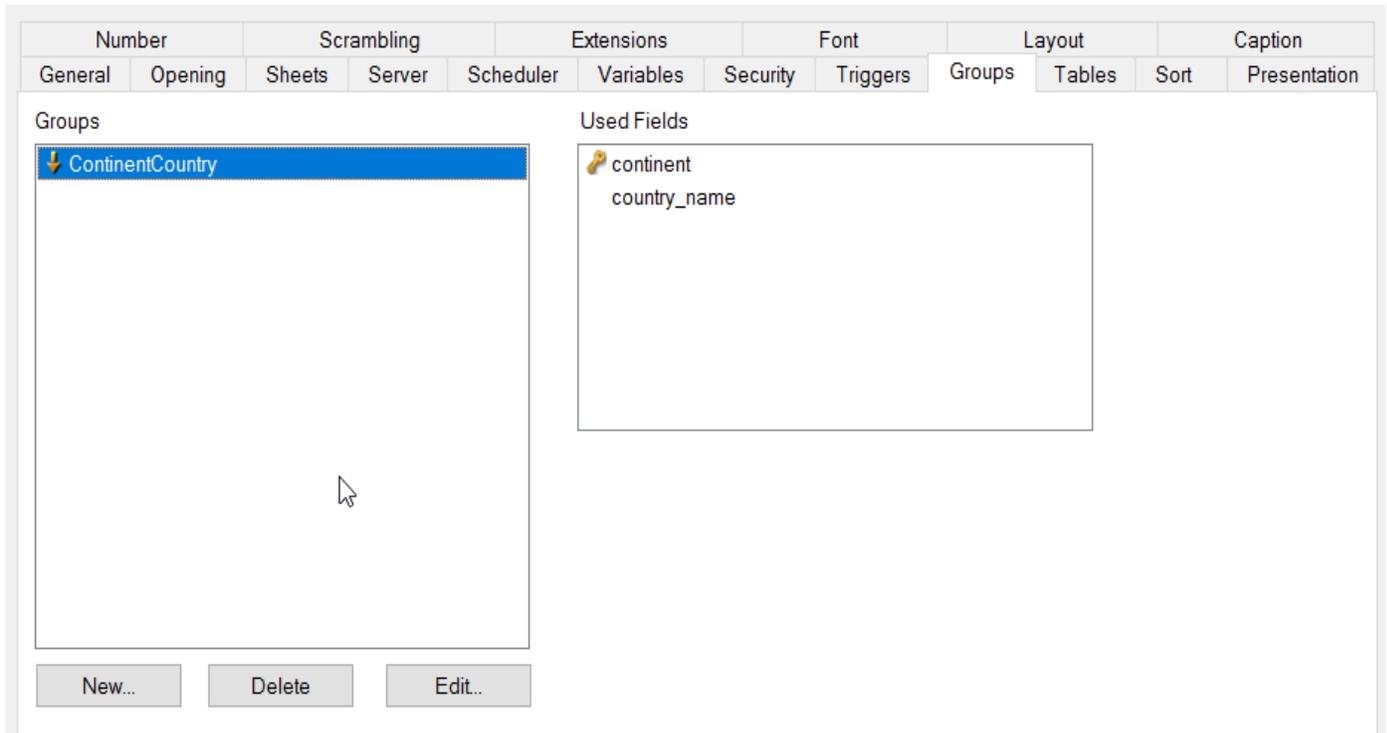
- k. Dataset to Dissolve: Choose *None* since the data already has been loaded and the Location Named Area definition is used. The parameters for the operation shall look like this.



- 6. Press next and choose which data you want to load. In this case all data can be loaded.
- 7. After the script has been generated, press Reload and the Connector will run the Operation Dissolve.
- 8. Now it is time to create the visualization
- 9. To create Drill Down with hierarchy of Continent to Country, open the *Document properties*.



10. Create a drill down Group with the Fields continent and country_name



11. Now everything needed for creating an area layer with drill down capabilities is in place.

Enable WebView and drag a map extension object and an area layer to the worksheet.

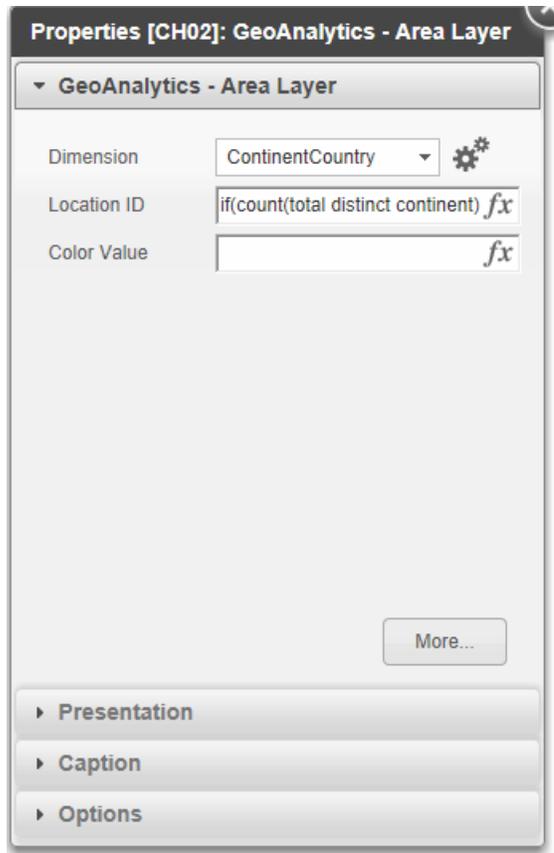
The extension objects are found by right clicking on the Work sheet and select *+New Sheet Object*.

12. Set the

Dimension: ContinentCountry (the drill-down group)

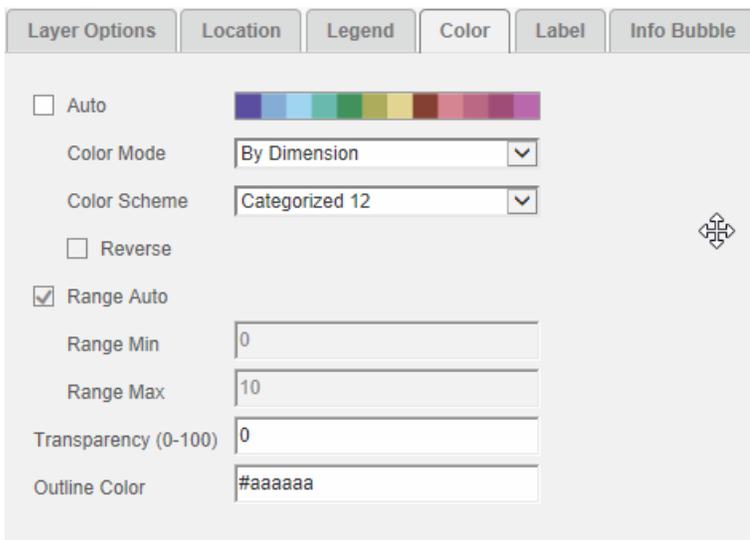
Location ID: if(count(total distinct continent)>1,continent_Geometry,CountryIso2)

13. In the example application: country_continent.qvw, airports have also been loaded, and introduced in the drill-down. The condition is to only visualize the airports, in a bubble layer, when one country is selected. Explore and add airports if you like.



14. For the visualization, the purpose is to add different colors for the continents and the countries as well as working with the Pop Up.

a. Start by setting the *Color* to Dimension.



- b. Customize the *Label* by adding:
`if(count(total distinct continent)>1,continent_Geometry,CountryIso2)`

Layer Options Location Legend Color Label Info Bubble

Show Label

Label

Out Resolution Limit

- c. Customize the *Info Bubble* in order to count the countries and display the number and the names:
`if(count(total distinct continent)>1,(Count(CountryIso2) &'countries in '& continent),country_name)`

Layer Options Location Legend Color Label Info Bubble

Show Info Bubble

Auto

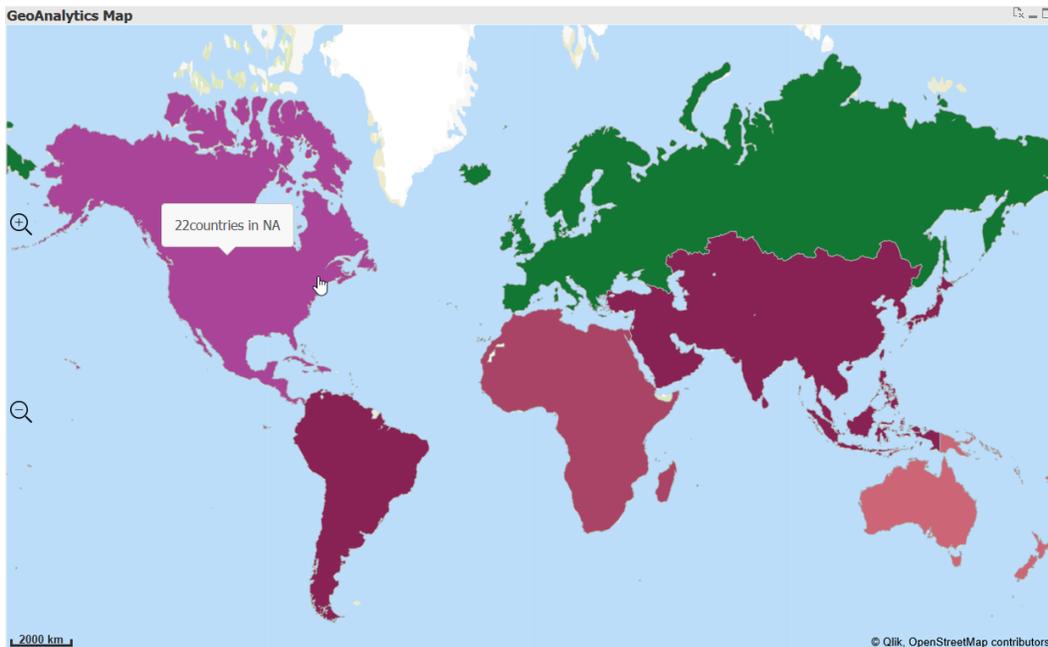
Info Bubble

Format Numbers

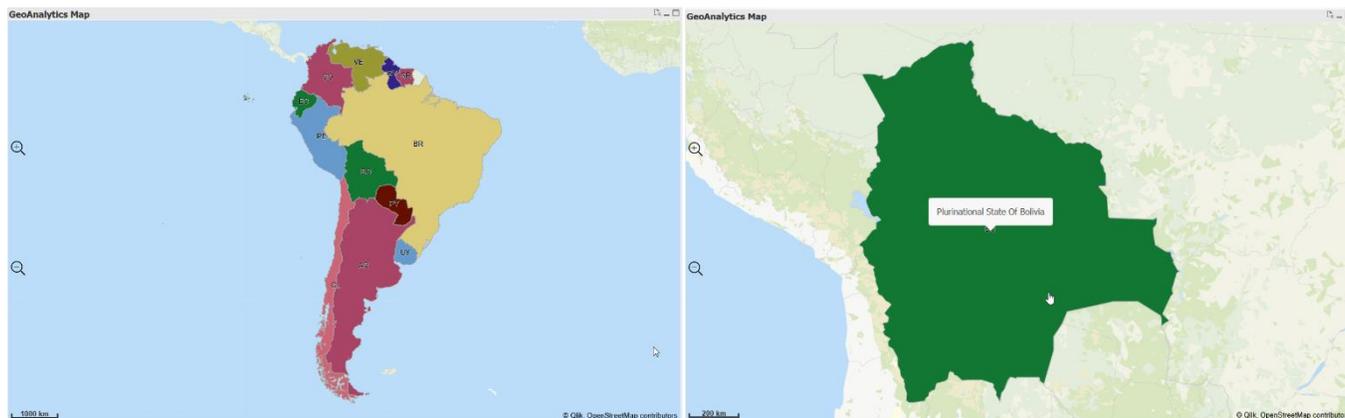
Auto-Format Numbers

Format Numbers List

15. With that a drill-down from Continent to Country has been created!
 Look something like this:



Select one Continent and drill down to the next level...



...and one step more!

This concludes this course – well done!

