

Elixir Map Designer Manual

Release 7.3



Elixir Technology Pte Ltd

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Elixir Technology Pte Ltd

Published 2008

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Chapter 1

Introduction

Overview

Elixir Repertoire Map Designer provides a graphical framework that adds a new dimension to data visualisation. Maps can be created that represent geographic areas, such as countries or regions, shops within a shopping mall or even the different departments in your office. The areas of the map are sensitive to mouse clicks, so you can use them to navigate through or filter relevant data. The areas can also be connected to data values, highlighting which sales regions performed best last quarter or which shops have the highest footfall.

Once a map has been designed, it is available in the Elixir Repository as a reusable component. This helps you ensure a consistent style and reduces maintenance across all of the analysis services that you deploy.

Getting Started

Before you can start creating maps, you need map data for the location you want to see. This data consists of two files, a shapefile (.shp) and a database file (.dbf). The pair of files should have the same name, for example Singapore.shp and Singapore.dbf. The shapefile format was defined by ESRI.

The shapefile holds both the shapes and coordinates of the map, whereas the database file holds the meaning of those shapes and points. Both are essential for rendering the map. As the file format for shapefiles has been published, and is a de-facto standard, you can create your own shapefiles if you can't find one that exactly matches your requirements.

Tip

Useful links:

- Download of shapefiles [<http://www.cdc.gov/epiinfo/asia.htm>].
- Explanation of common data column [<http://www.cdc.gov/epiinfo/documents/shapes.txt>] in the .dbf file.

Important

While there are a number of shapefiles available on the Internet, you need to verify that the license allows you to incorporate them in your applications.

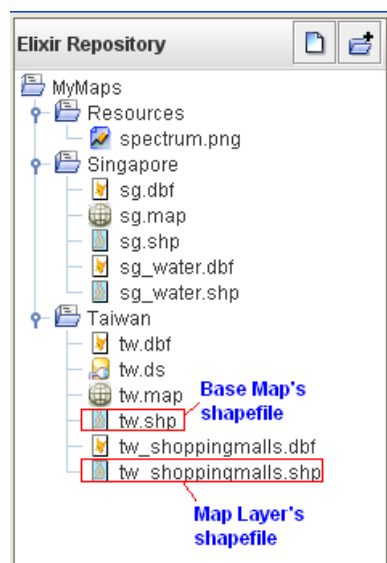
Chapter 2

Map Creation

Step 1 : Store the Shapefiles in the Repository

1. Save the .shp and .dbf files in a repository location where all users of the map will have read access to them.

Figure 2.1. Store Shapefiles in the Repository



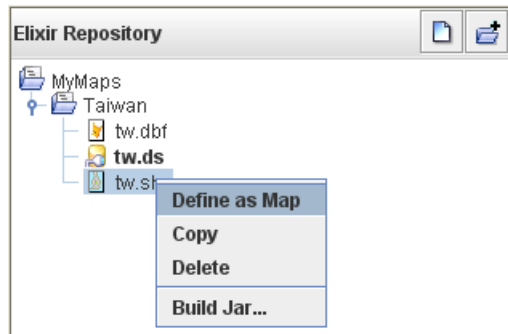
Note

- In order for the map to render successfully,
 - The shapefiles must be kept together in the same folder.
 - The naming of .shp and .dbf files must be the same.

Step 2 : Create Map file from .shp file

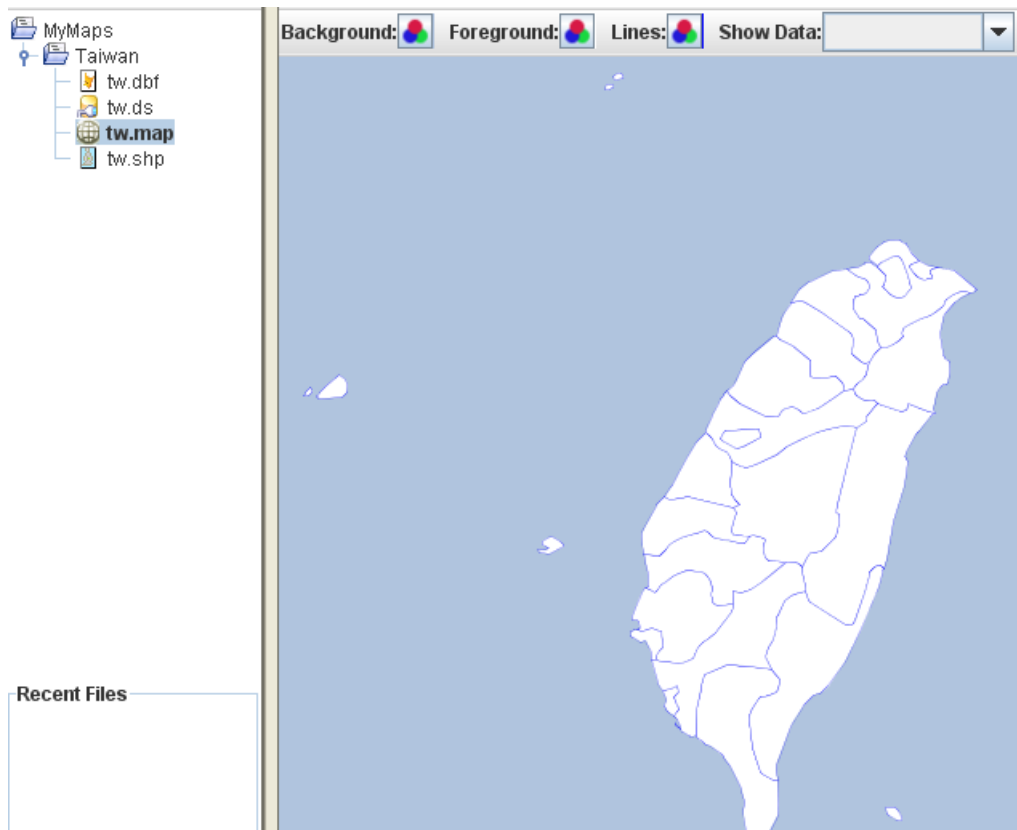
1. Select the .shp file that will form the background of your map and trigger the 'Define As Map' action in the .shp file popup menu.

Figure 2.2. Define .shp file as .map file



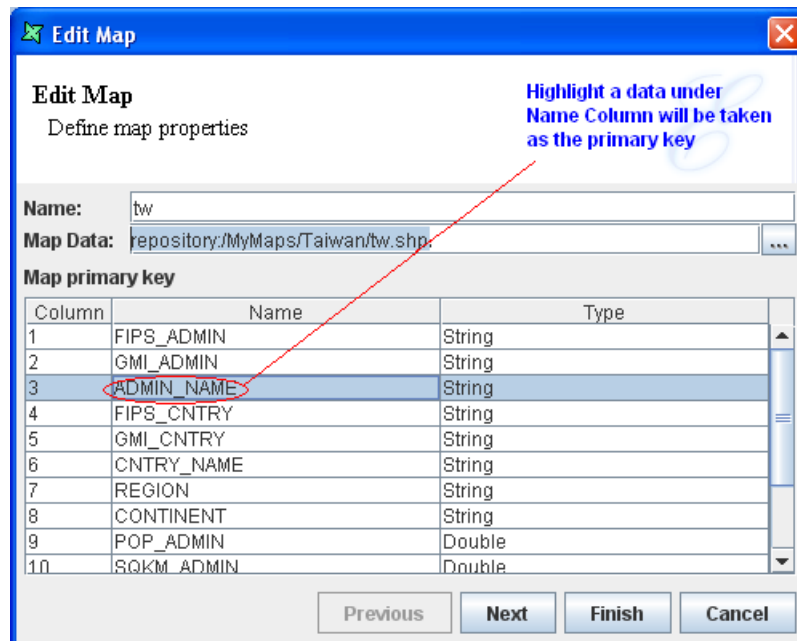
2. A default .map file will be created and displayed in the Elixir Workspace as shown:

Figure 2.3. Display default .map file



Step 3 : Define Primary Key

1. Select the .map file and trigger the 'Open Properties' action from the .map file popup menu.
2. Select an appropriate Primary key and select Next button.

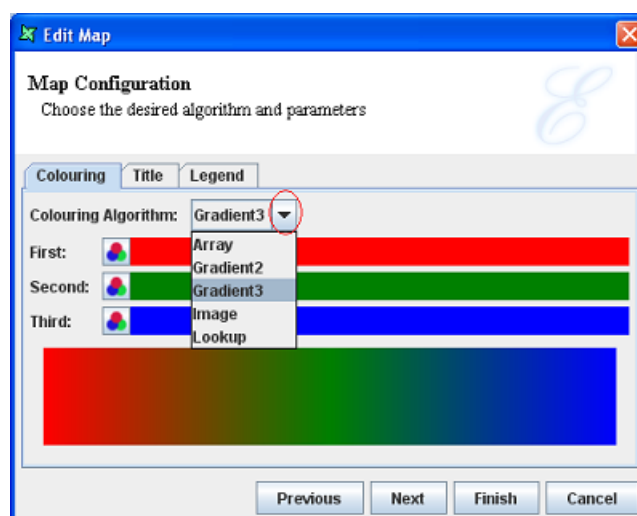
Figure 2.4. Select Primary Key**Tip**

Why is ADMIN_NAME a more appropriate primary key?

If the base map has many regions, it may be a better choice to show as a hovering legend when cursor is placed over each region.

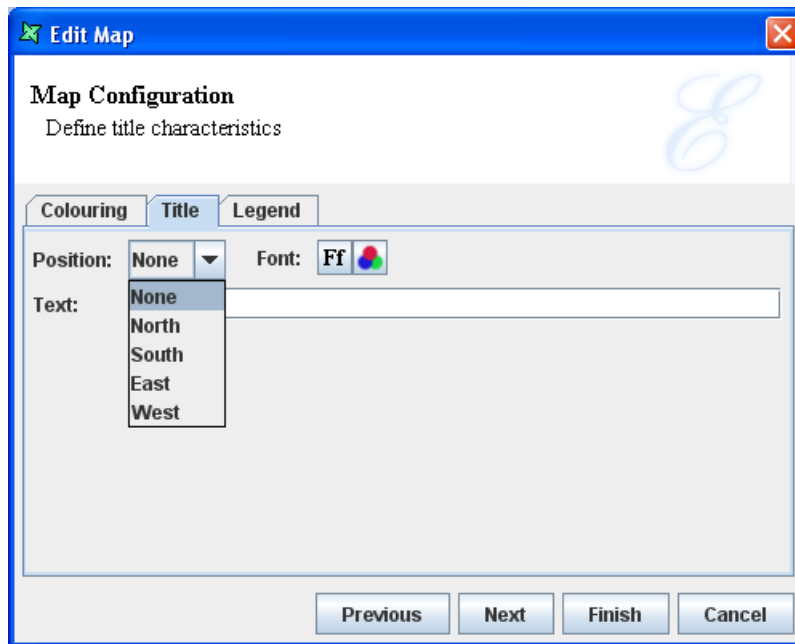
Step 4 : Customise Base Map Format

1. You will see the “Map Configuration” page where you can customise the appearance of the map.
2. Under the “Colouring” Tab, select the type of colouring algorithm that you want to use to colour the regions of your map.

Figure 2.5. Select Appropriate Colouring Algorithm

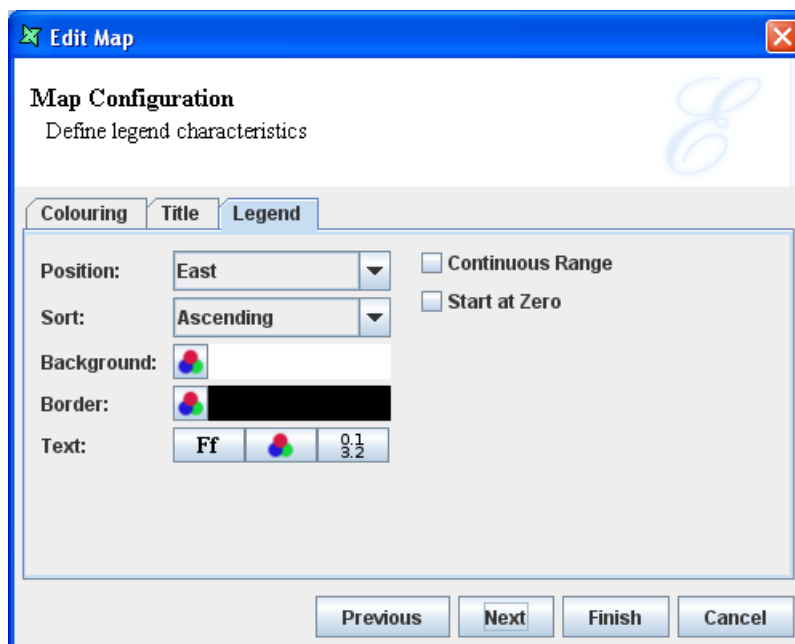
3. Under the 'Title' Tab,
 - Text option : (Optional) Enter a title that will appear on your map.
 - Font option : (Optional) Select the size and colour of the title.
 - Position option : (Optional) Place the title at the top (north), bottom (south), east (right) or west (left) of your map.

Figure 2.6. Format Title



4. Under the Legend Tab, select the characteristics of the map legend.

Figure 2.7. Format Legend



Tip

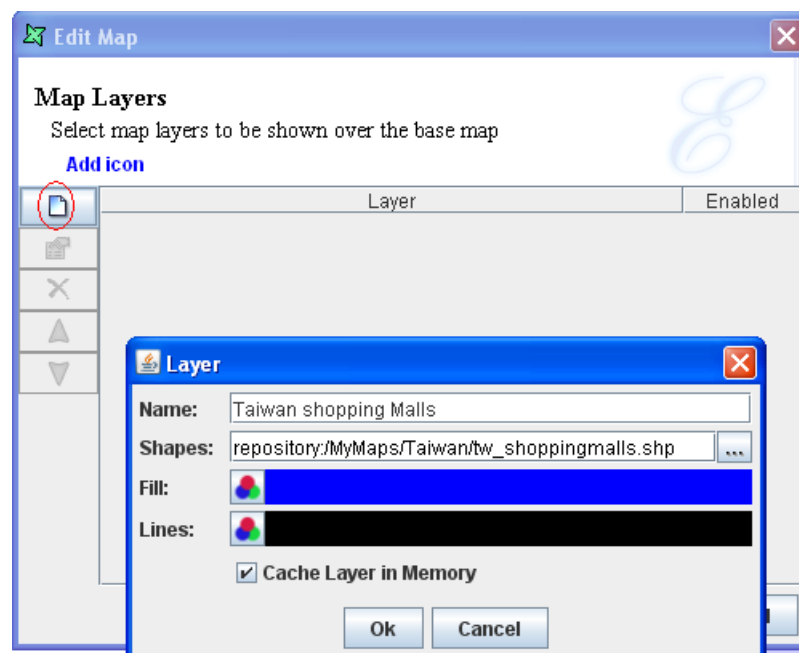
- If you select “None” then you will still be able to see a tip based on the map primary key by hovering the mouse cursor over the region you are interested in.
- If there are a lot of coloured regions on your map, showing colours derived from numeric data, you should consider enabling the “Continuous” option (refer to Legend)

Step 5 : Add Map Layer(s) to the Base Map

If you have Map Layers that you wish to add on to the base map, they can be configured here. If not, you can click the Finish button to complete the creation process.

1. Click the Add icon and enter the details as follows:
 - Name option : Type a meaningful name for your map layer.
 - Shapes option : (As an example shown in Figure 2.8, “Format Map Layer”) Type the path as “repository:/MyMaps/Taiwan/tw_shoppingmalls.shp ” which is the path of the folder names that you store the map layer's shapefiles.
 - Fill option : (Optional) Select the colour that you want to appear in the area of the map layer.
 - Line option : (Optional) Select the colour that you want the outline of map layer to appear especially any railroad or highway routes which are usually represented by lines.

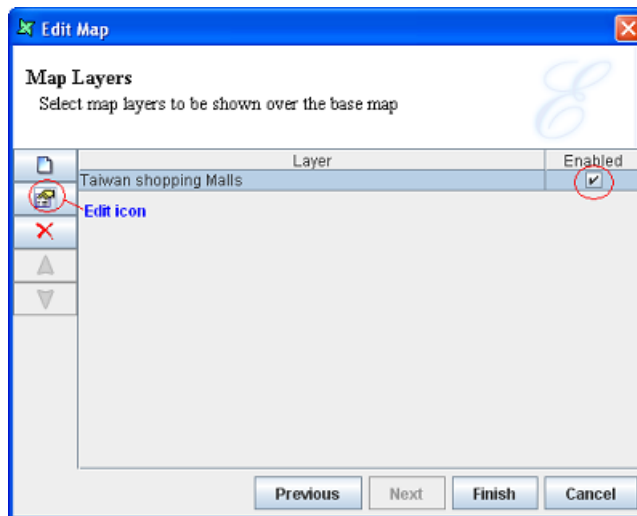
Figure 2.8. Format Map Layer



Tip

You can select the layer map .shp file and trigger the Copy action to store the location path to the clipboard so that you can paste the path under the “Shape” option.

2. When a map layer is added, click the check box to enable the map layer to appear as an overlay on the base map. You can click the Edit icon if you wish to modify the earlier setup.

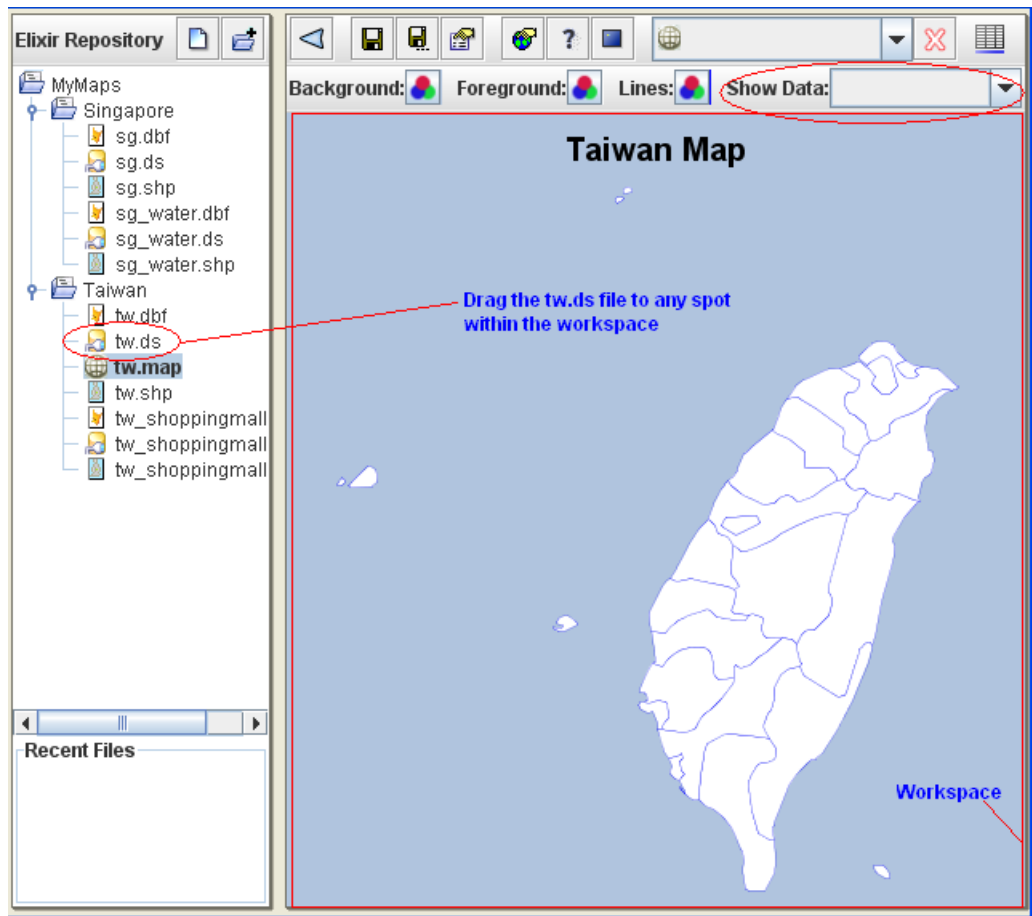
Figure 2.9. Enable Map Layer

Step 6 : Final Format to Show a Complete Map

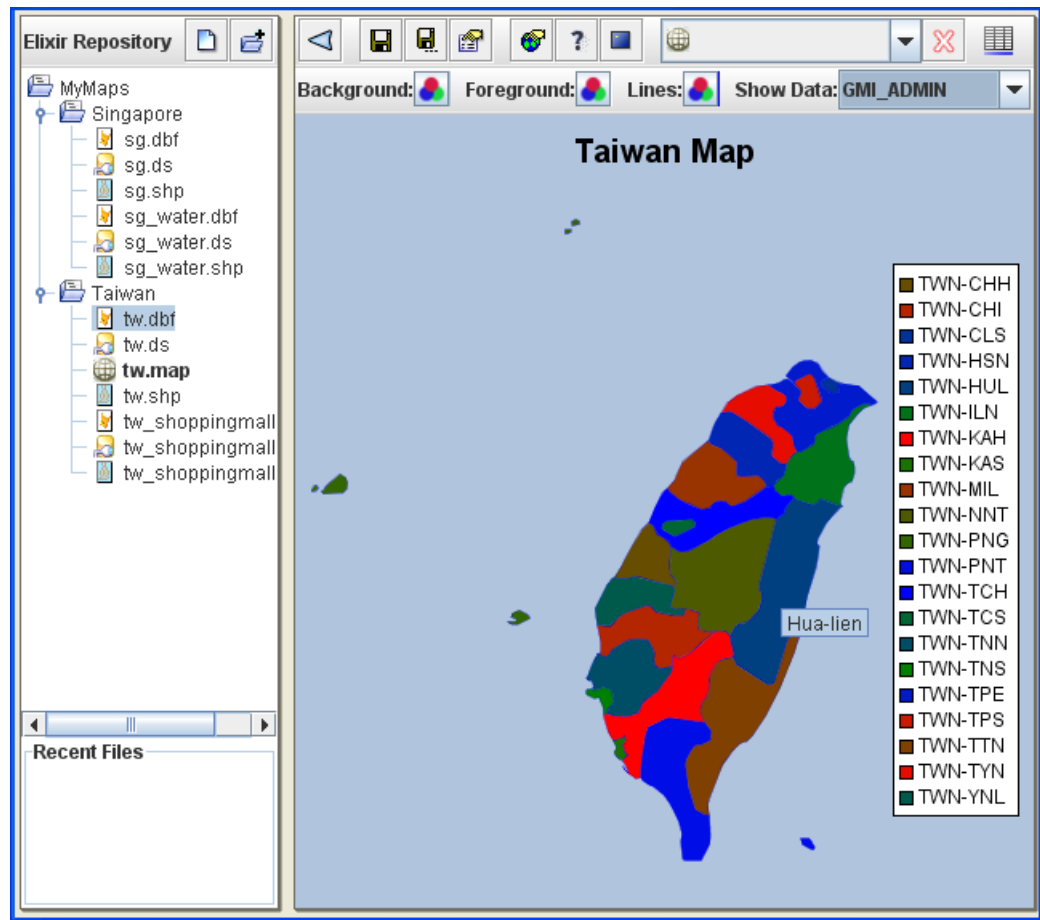
If your base map has “fill-regions” data and a particular Colouring Algorithm is already setup, you can now preview the map with data so that you can see how it will look when the user views it.

1. Drag the datasource you wish to preview (the base map .ds file is a good place to start) to anywhere within the Map view and drop it. This is to populate the “Show Data:” combo box with the data from the .ds file.

Figure 2.10. Populate 'fill-regions' Data



2. Click the down arrow in the combo box and select the fieldname (data-of-analysis) to activate the Colouring Algorithm type that you have chosen.

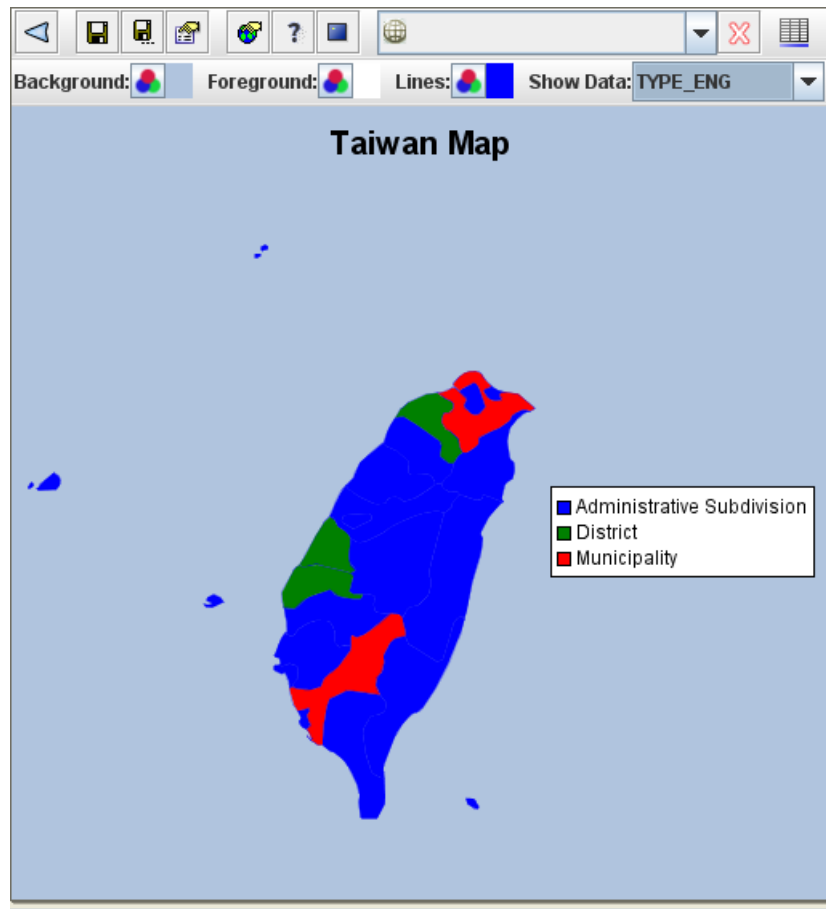
Figure 2.11. Select Fieldname to Activate Colouring**Tip**

If a “text” legend is required, I would suggest to use GMI_ADMIN as the next best option to describe all regions on the map.

3. If you hover your cursor over any one region, you can see the region's name appear as “Hua-lien” (in the case of Figure 2.11, “Select Fieldname to Activate Colouring”). You can select any field name (data-of-analysis) to experiment how the map will appear with each selection.

Tip

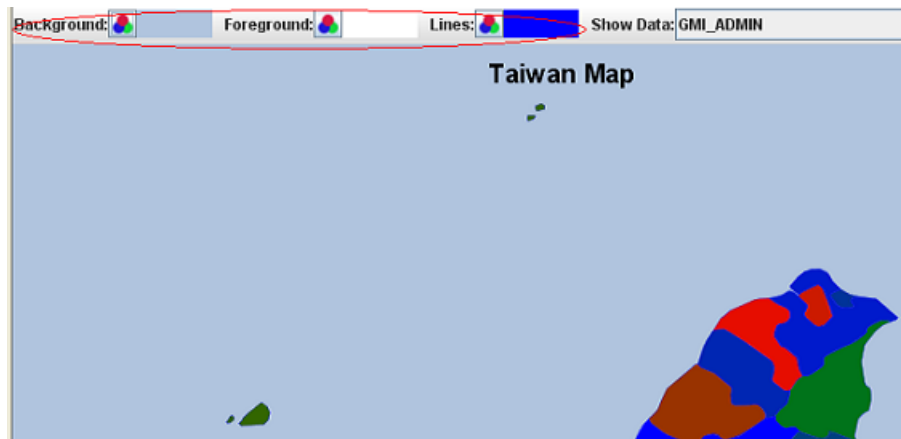
In my sample, an interesting fieldname (data-of-analysis) TYPE_ENG shows a group of regions under a specific category. Thus, when selecting this fieldname, you can see that a number of regions are classified under the same colouring tone instead. In this case, legend is best to display in order to identify all the categories for each region.

Figure 2.12. Effect of Different Data-of-Analysis on Colouring**Note**

GMI_ADMIN and TYPE_ENG are common field names found in many .dbf files. There are still some .dbf files which do not have such field names or the same data may have different field names.

4. On the top of the Elixir Workspace, there are optional formatting that you can specify further to enhance the image of your map.
 - Background option : Select the colour that you want to appear outside the base map area.
 - Foreground option : Select the colour that you want to appear inside the base map area.
 - Lines option : Select the colour that you want the outline of the regions to appear as.

Figure 2.13. Additional Colour Formatting of Map



Tip

- The foreground colour is useful to specify for those regions that don't have the “fill-regions” data in the .ds file. It helps to contrast the rest of the coloured regions.
- It is also useful for a base map whose purpose is to show map layers clearly. Thus, the foreground colour should be one that can bring out the clarity of the points on the base map. (Refer to the section called “Map Layers”).

Chapter 3

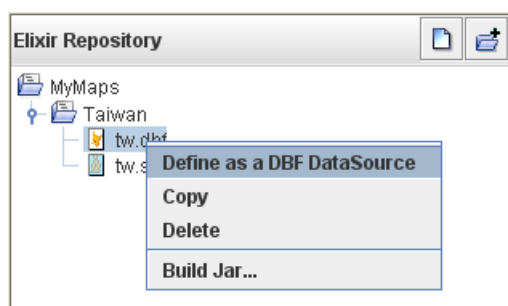
Data Integration

Convert .dbf file into .ds file

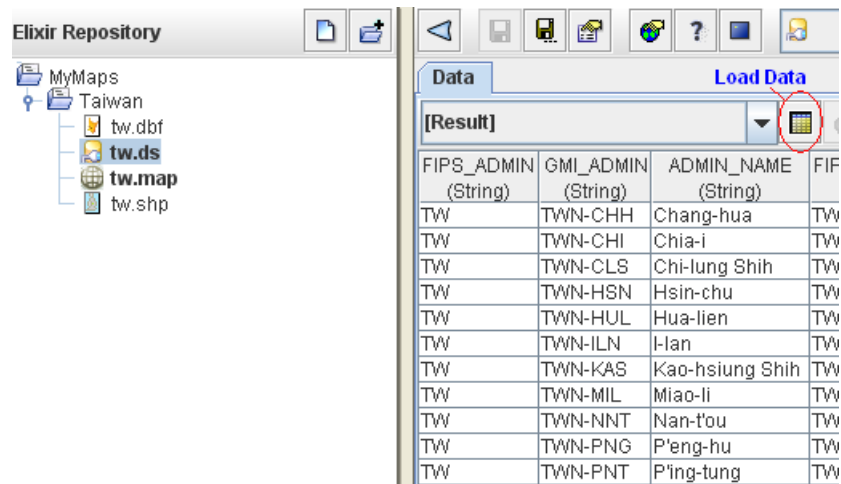
When you want to show colours on a map, you need to choose a set of data to show and a colouring algorithm to describe how to convert the data into colours for display. The simplest source of data is the .dbf file that accompanies the .shp file. This contains the name of each region on the map, and often contains useful information such as area that you can use as sample data for testing. In order to use the .dbf, you need to convert the .dbf file to a .ds file.

1. Select the .dbf file and trigger the “Define as a DBF DataSource” action in the .dbf file popup menu.

Figure 3.1. Convert .dbf file to .ds file



2. A default .ds file will be created
3. Select the .ds file and trigger the “Open Properties” action to view the contents (usually there is no need to modify the properties). Click the Finish button when done.
4. To view the data of the .ds file, click the “Load Data” icon as shown:

Figure 3.2. View Data of .ds file

The screenshot shows the Elixir Repository interface. On the left, a tree view under 'MyMaps' shows a folder 'Taiwan' containing files 'tw.dbf', 'tw.ds', 'tw.map', and 'tw.shp'. The 'tw.ds' file is selected. On the right, the 'Data' pane shows a table with the following columns and data:

FIPS_ADMIN (String)	GML_ADMIN (String)	ADMIN_NAME (String)	FIF
TW	TWN-CHH	Chang-hua	TW
TW	TWN-CHI	Chia-i	TW
TW	TWN-CLS	Chi-lung Shih	TW
TW	TWN-HSN	Hsin-chu	TW
TW	TWN-HUL	Hua-lien	TW
TW	TWN-ILN	I-lan	TW
TW	TWN-KAS	Kao-hsiung Shih	TW
TW	TWN-MIL	Miao-li	TW
TW	TWN-NNT	Nan-t'ou	TW
TW	TWN-PNG	P'eng-hu	TW
TW	TWN-PNT	P'ing-tung	TW

Note

Some shape files contain layer information, for example roads or hospitals. The .dbf files that accompany these shape files may not contain any useful region information for colouring. Using the Elixir data source tools it is easy to review the contents of the .dbf to see what information is provided.

Chapter 4

Designer Features

Colouring Algorithm

The algorithm decides the colour scheme that will be used to fill each region of the base map.

Array

The Array algorithm lets you specify a number of colours and use each in turn for a data item. This works best when the number of colours you choose is greater than or equal to the number of unique data values, otherwise there will be some repetition of the colours.

For the field name (data-of-analysis) you selected under the “Show Data” combo box, the first region will take the first colour and so on until the 6th colour is utilised by the 6th region. The 7th region will use back the first colour.

Note

- It is useful to apply in a map with only a few regions to fill the colour scheme as shown in the example Figure 4.1, “Colouring Algorithm - Array (with few regions) ”.
- An example of inappropriate usage of this colouring algorithm is shown in Figure 4.2, “Colouring Algorithm - Array (with numerous regions)”. This colour scheme can still be used if specific colour type is important but not critical to differentiate each region.

Figure 4.1. Colouring Algorithm - Array (with few regions)

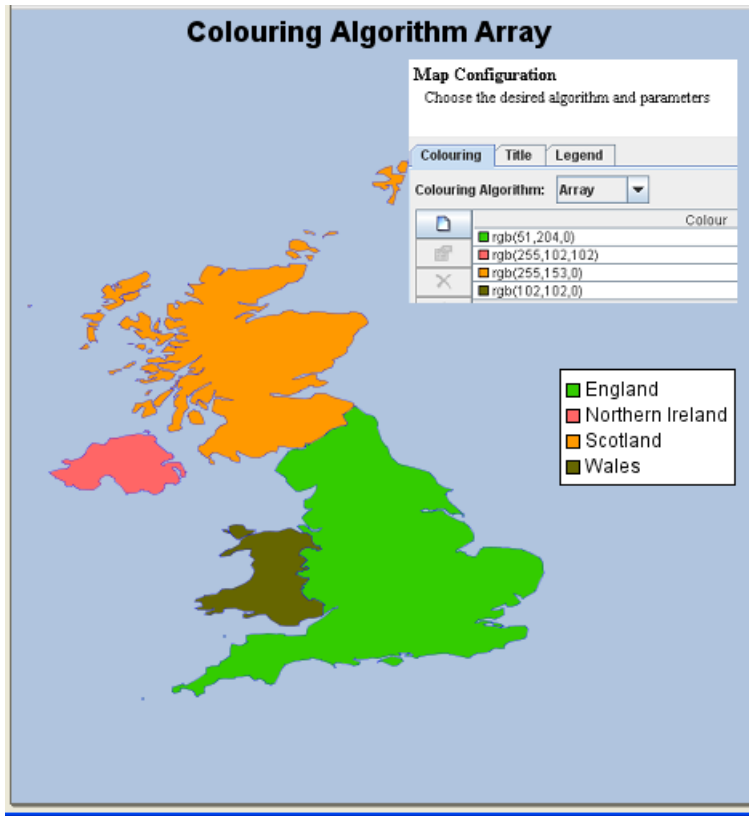
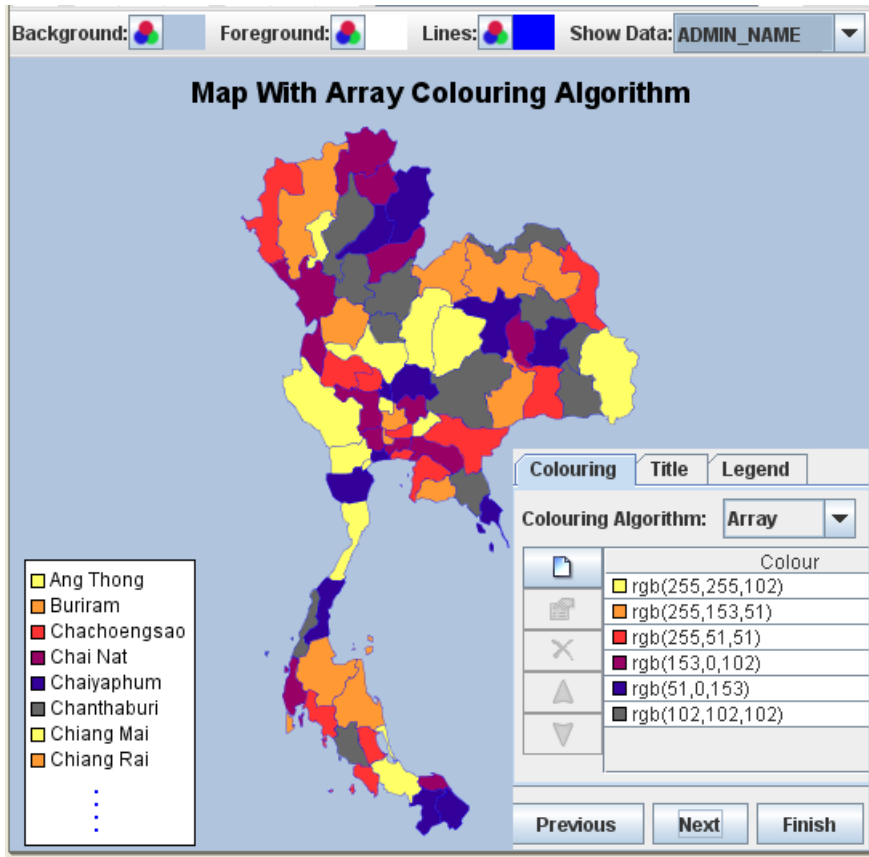


Figure 4.2. Colouring Algorithm - Array (with numerous regions)

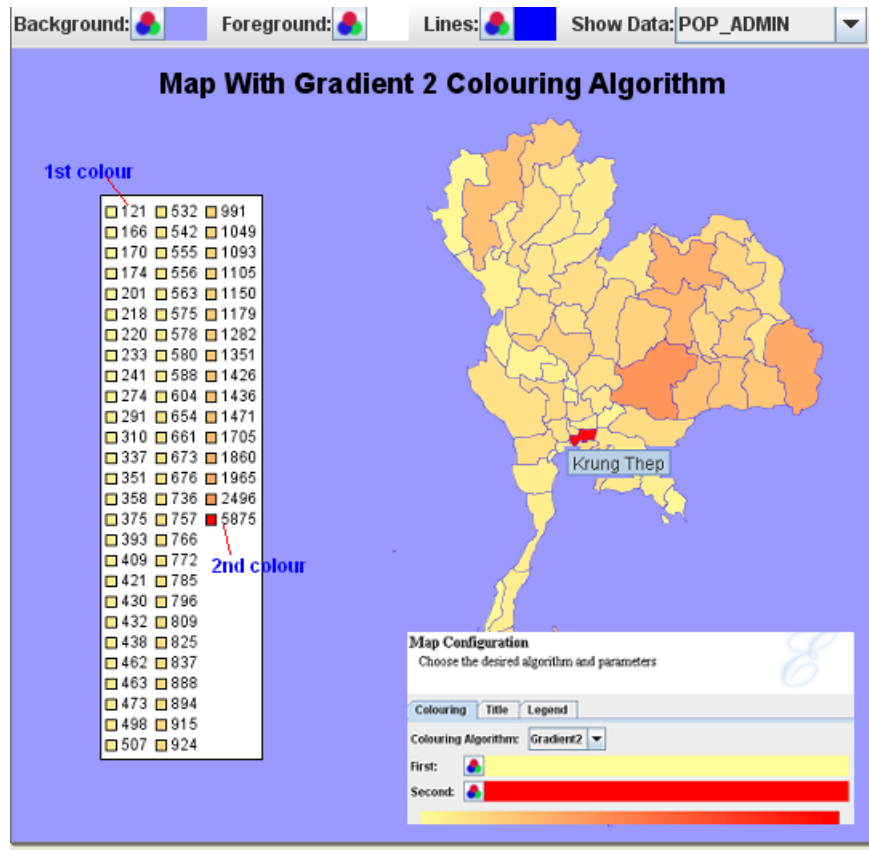


Gradient 2

A range of colours will be blended from the first colour specified to the second colour specified as shown in the Map Configuration - “Colouring” Option.

For the field name (data-of-analysis) you selected under the “Show Data” combo box, the first region will take on the first colour specified, subsequent regions will take on the increasing colour tone down the line until the last region will usually take on the second colour specified.

Figure 4.3. Colouring Algorithm - Gradient 2



Note

The legend displayed in Figure 4.3, “Colouring Algorithm - Gradient 2” is for the purpose of explaining the effect of the Gradient 2 on the colouring of the regions. There is no need to display such legend on map.

Tip

- This colour scheme is useful if you wish to see an increasing colour tone for data that you wish to reflect the gradual effect of the regions concern.
- An example like in Figure 4.3, “Colouring Algorithm - Gradient 2” , POP_ADMIN is selected to show the regions of increasing population size compared to the size of the regions.
- At one glance, the region with the largest population size is in a very small town called Krung Thep.
- There are many lighter tone coloured regions as compared to the darker ones, which indicates that 'small-sized populations' regions are very prominent in the base map.

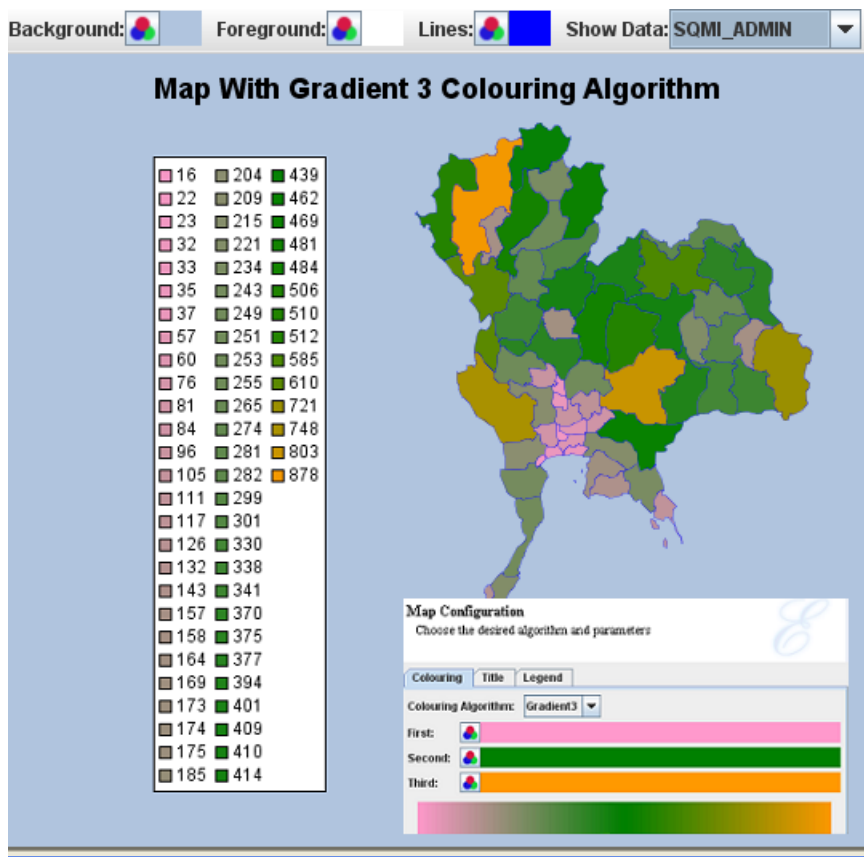
Gradient 3

Gradient 3 is similar to Gradient 2, but the range of colour will be blended from first colour to second colour (median) to third colour instead.

This colour scheme is useful if you wish to see an increasing colour tone for data that you wish to reflect the gradual effect of the regions concern especially to highlight regions that fall in the median range.

An example like in Figure 4.4, “Colouring Algorithm - Gradient 3”, SQMI_ADMIN is selected to show the regions of increasing area in square miles. Select a totally different colour tone as the median so as to differentiate from the first and third colour. At a glance, you can see there are many green tone regions which indicates that they are about the same size each.

Figure 4.4. Colouring Algorithm - Gradient 3

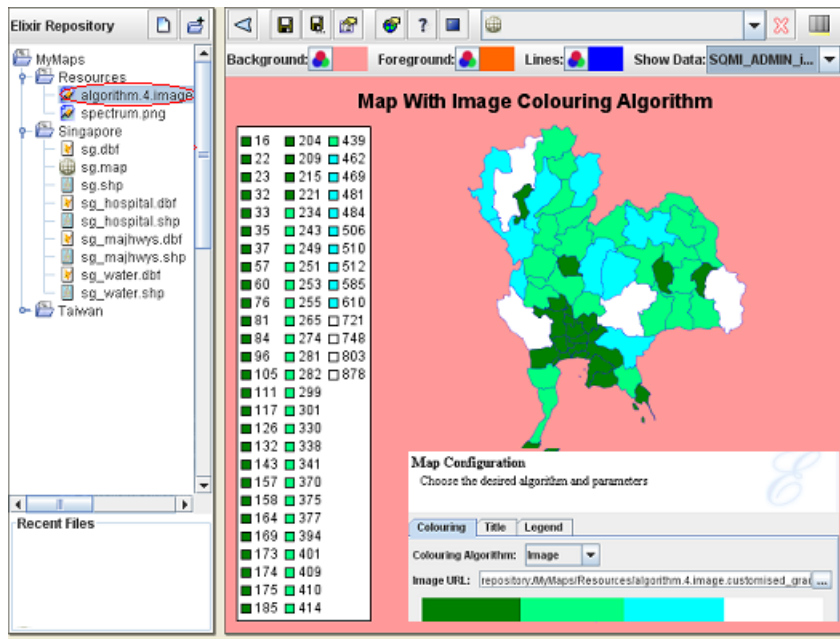


Image

You can create your own images to choose exactly the gradient that you want. For example, you could create a “4-gradient” image with a dark green to medium green to light blue and then to white. Before you can use this option, ensure that the image file is available in the Repository.

Select the image file and trigger the Copy action, so as to store the location path in the clipboard. Then, at the Map Configuration Section - “Colouring” option, paste the location path of the image in the “Image URL:”.

Figure 4.5. Colouring Algorithm - Image



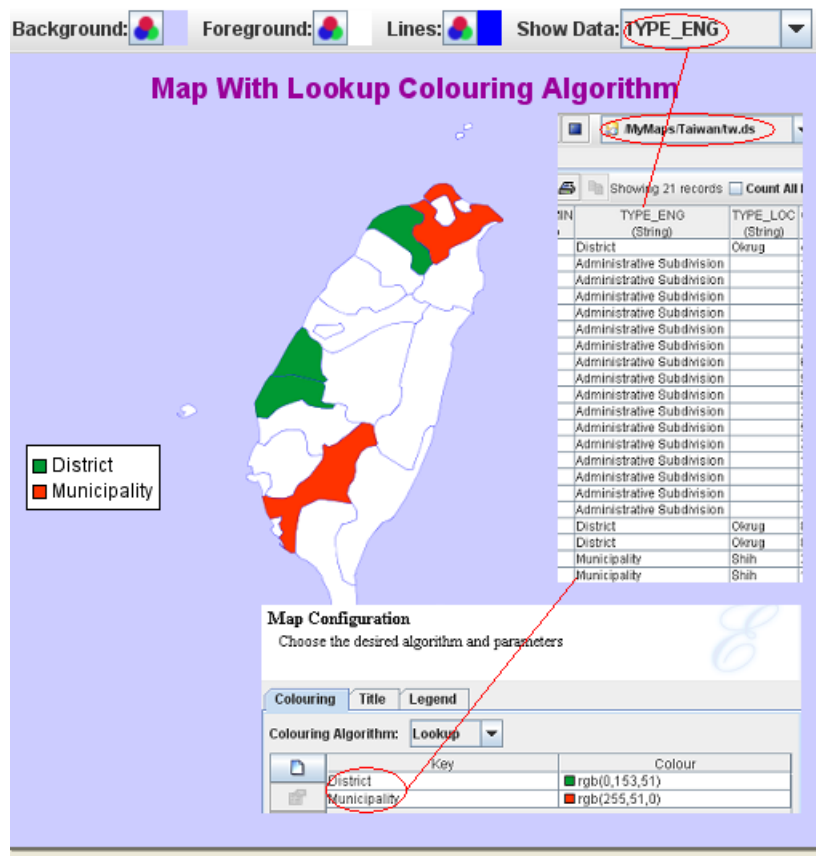
Tip

- If you require each region to have its own unique colour, then the default image spectrum.png has a wide range of blended colours to differentiate all the individual regions.

Lookup

- It is useful if you only want some of the regions to appear coloured and the rest can follow the foreground colour of the base map. In the example of Figure 2.12, "Effect of Different Data-of-Analysis on Colouring ", all the 3 categories are coloured, thus if you only want 2 categories to be coloured, you may use this option for just this purpose.

Figure 4.6. Colouring Algorithm - Lookup



Note

The labels entered for each colour specified under the key option, must tally with the data of the particular region's field name (data-of-analysis) that you want to study.

Tip

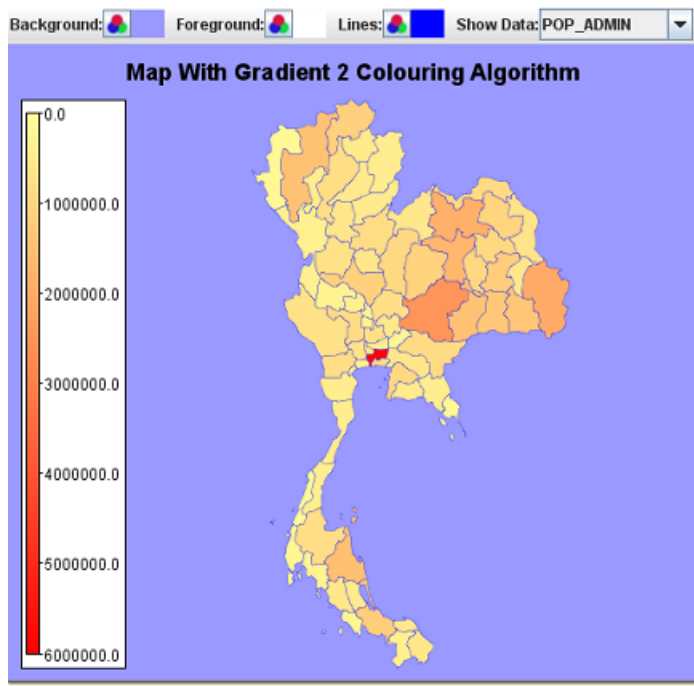
Lookup is also important where the colours themselves have significance. One weakness of the current charts (using FruitSales.ds) is that you will often see a bar chart where Strawberry appears Yellow and Banana appears Red. If you want to ensure that a particular region to always show a particular colour, as in the example of a USA map, I will specify the colouring algorithm for Republicans “fill-region” data as Red and Democrats “fill-region” data as Blue (These are the party colours).

Legend

Legend will appear as a box on the map, to show the contents (in the form of “text” or “continuous range” format) of all the regions (data-of-analysis).

In the case of the example in Figure 4.3, “Colouring Algorithm - Gradient 2” , the population sizes of all the regions are shown in the legend box, thus the map may not look presentable. By enabling the “Continuous” Option, the legend becomes smaller and shows only a range of blended colours with default major tabs.

Figure 4.7. A Sample of Continuous Legend



“Start At Zero” option is a preference whether to show the range from zero (click the check box to enable) or from the roundup figure nearest to your minimum and maximum 'fill-regions' data (click the check box again to disable).

Figure 4.8. A Sample of Continuous Legend with “Start At Zero” Option

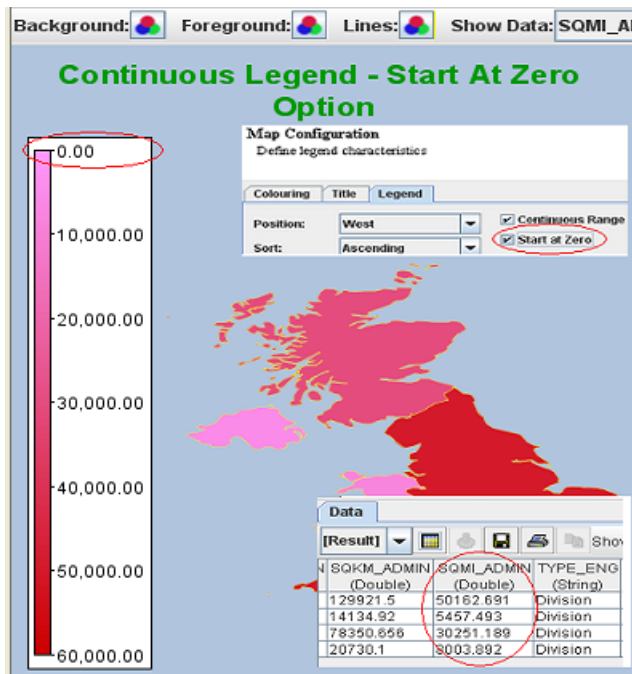
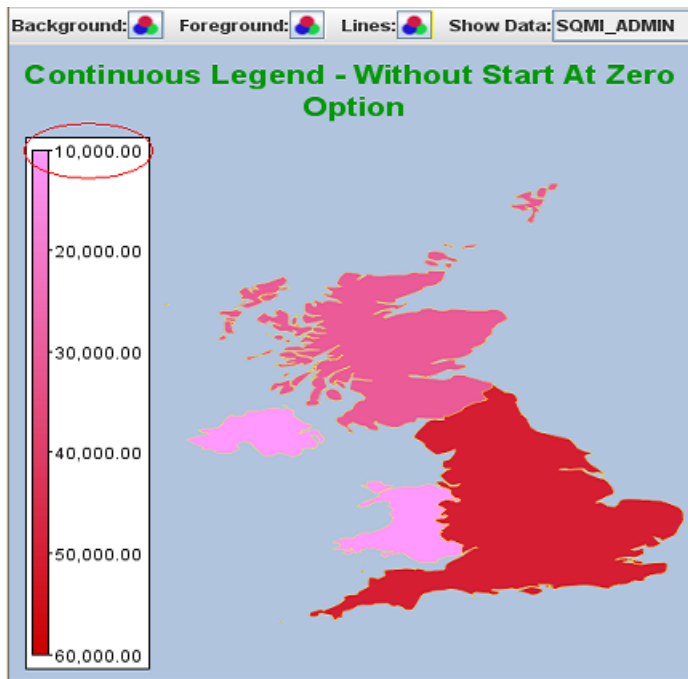


Figure 4.9. A Sample of Continuous Legend without “Start At Zero” Option**Note**

- The “Continuous” and “Start At Zero” Options can only be used when you select a numeric fieldname (data-of-analysis).
- The “Start At Zero” Option will be effective only when the “Continuous” Option is enabled too.

Map Layers

They are the add-on maps over the base map (the first map that you want to appear as the outline first, as shown in Figure 4.10, “Example of Base Map without Map Layer” .

These add-on maps can be additional graphics like canals, road routes, shopping malls, libraries, etc.

From the example Figure 4.11, “Example of a Base Map with Map Layers” , the blue strips are the Singapore canals, the black line represent the major highways and the red dots represent the hospitals and polyclinics whereby you can see the specific names when you hover the cursor over the red dots.

Figure 4.10. Example of Base Map without Map Layer

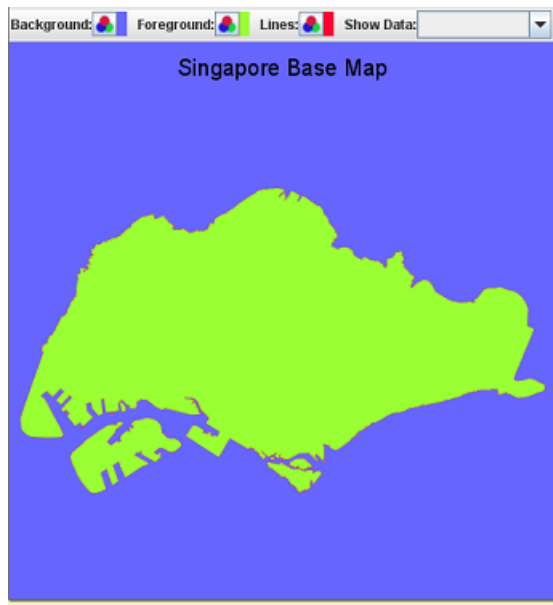
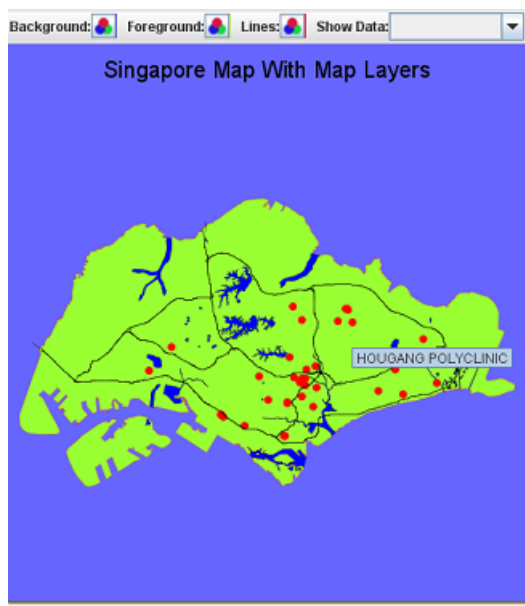


Figure 4.11. Example of a Base Map with Map Layers



Primary key

This key is a fieldname with non-duplicate data. It is necessary to select which key you intend to use as a primary key in order to show as meaningful “hovering legends” when you place your cursor over any region. By default, it will select the first fieldname (Column 1) as the primary key.