

# Leaflet Web Maps with qgis2leaf

QGIS Tutorials and Tips



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# Leaflet Web Maps with qgis2leaf

## **Warning**

qgis2leaf plugin is no longer in active development. The functionality of this plugin is folded into a new plugin called **qgis2web**.

See [Web Mapping with QGIS2Web](#) tutorial for an updated version of this tutorial.

Leaflet is a popular open-source Javascript library for building web mapping applications. **qgis2leaf** plugin provides a simple way to export your QGIS map to a functioning leaflet-based web map. This plugin is a useful way to get started with web mapping and create an interactive web map from your static GIS data layers.

## Overview of the task

We will create a leaflet web map of world's airports.

## **Other skills you will learn**

- Using CASE SQL statement in Field Calculator to create new field values based on different conditions.
- Locating and using SVG custom icons in QGIS.

## Get the data

We will use the [Airports](#) dataset from Natural Earth.

[Download the Airports shapefile.](#)

Data Source [NATURALEARTH]

## Procedure

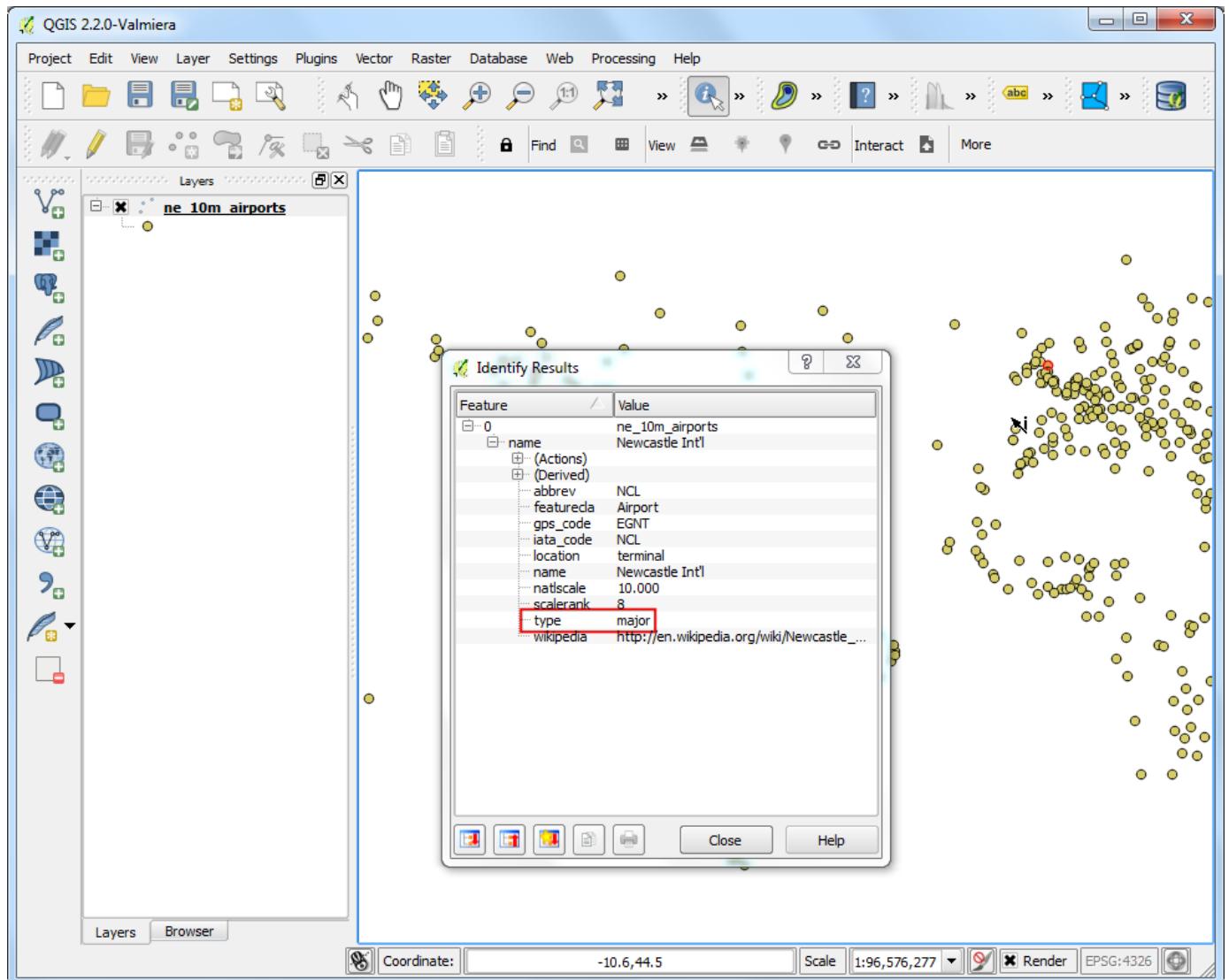
1. Install the `qgis2leaf` plugin by going to Plugins > Manage and Install Plugin. Note that the plugin is currently marked **experimental**, so you will need to check Show also experimental plugins in Plugin Settings. (See [Using Plugins](#) for more details on installing plugins in QGIS)



2. Unzip the downloaded `ne_10m_airports.zip` file. Open QGIS and go to Layer ▶ Add Vector Layer. Browse to the location when the files were extracted and select `ne_10m_airports.shp`. Click OK.



3. Once the `ne_10m_airports` layer is loaded, use the Identify tool to click on any feature and look at the attributes. We will create an airport map where we classify the airports into 3 categories. The attribute type will be useful when classifying the features.



4. Right-click the `ne_10m_airports` layer and select Open Attribute Table.



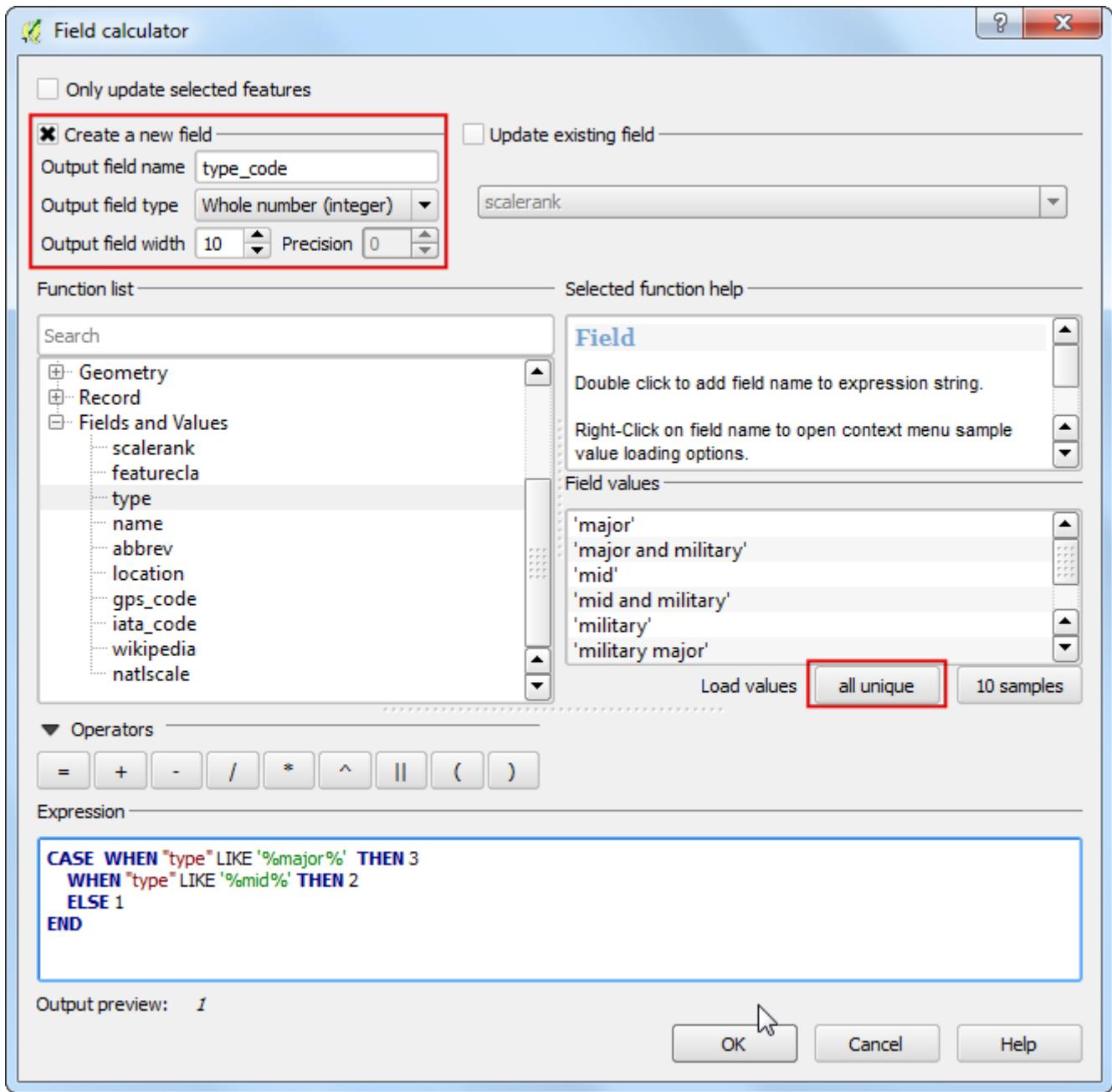
5. In the attribute table dialog, click the Toggle Editing button. Once the layer is in editing mode, click the Open Field Calculator button.

The screenshot shows a QGIS attribute table for the layer 'ne\_10m\_airports'. The table has 49 rows and 10 columns. The columns are: scalarank, featuredfa, type, name, Open field calculator (Ctrl+I) (button), gps\_code, iata\_code, and wiki (button). The 'Open field calculator' button is highlighted with a red circle. The 'Show All Features' button at the bottom left is also circled in red.

	scalarank	featuredfa	type	name	Open field calculator (Ctrl+I)	gps_code	iata_code	wiki
27	9	Airport	mid and military	Gwangju	KWJ	terminal	RKJJ	http://e...
28	9	Airport	mid	Daegu Int'l	TAE	terminal	RKTN	http://e...
29	9	Airport	mid	Ulsan	USN	terminal	RKPU	http://e...
30	9	Airport	mid	Radin Inten II	WIIT	terminal	WIAT	http://e...
31	9	Airport	military	Allahabad	IXD	ramp	VIAL	http://e...
32	9	Airport	mid	Chelyabinsk	CEK	terminal	USCC	http://e...
33	8	Airport	military mid	Tainan	TNN	ramp	RCNN	http://e...
34	8	Airport	military mid	Taichung	RMQ	ramp	RCMQ	http://e...
35	8	Airport	mid	Rotterdam The H...	RTM	terminal	EHRD	http://e...
36	8	Airport	mid	Voronezh-Cherto...	VOZ	terminal	UUOO	http://e...
37	8	Airport	major	Liverpool John Le...	LPL	ramp	EGGP	http://e...
38	8	Airport	mid	Vishakapatnam	VTZ	terminal	VEVZ	http://e...
39	8	Airport	major	Sultan Hasanuddi...	UPG	terminal	WAAA	http://e...
40	8	Airport	mid	Vava'u Int'l	VAV	terminal	NFTV	http://e...
41	8	Airport	major	Newcastle Int'l	NCL	terminal	EGNT	http://e...
42	8	Airport	mid	Goloson Int'l	LCE	terminal	MHLC	http://e...
43	8	Airport	major	Madinah Int'l	MED	terminal	OEMA	http://e...
44	8	Airport	mid	Mirabel Int'l	YMX	terminal	CYMX	http://e...
45	8	Airport	mid	Palanga Int'l	PLQ	terminal	EYPA	http://e...
46	8	Airport	mid	Jaipur Int'l	JAI	terminal	VIJP	http://e...
47	8	Airport	mid	Sonari	IXW	terminal	VEJS	http://e...
48	8	Airport	mid	Yenisehir	YEI	ramp	LTBR	http://e...
49	8	Airport	major	Sakirpasa	ADA	terminal	LTAF	http://e...

6. We want to create a new attribute called `type_code` where we give major airports a value of 3, mid-sized airports a value of 2 and all others a value of 1. We can use the `CASE` statement and write an expression that will look at the value of `type` attribute and create a `type_code` attribute based on the condition. Check the Create a new field box and enter `type_code` as the Output field name. Select Whole number (integer) as the Output field type. In the Expression window, enter the following text.

```
CASE WHEN "type" LIKE '%major%' THEN 3
      WHEN "type" LIKE '%mid%' THEN 2
      ELSE 1
END
```



7. Back in the Attribute Table window, you will see a new column at the end. Verify that your expression worked correctly and click the Toggle Editing button to save the changes.

Attribute table - ne\_10m\_airports :: Features total: 891, filtered: 891, selected: 0

	name	abbrev	location	gps_code	iata_code	wikipedia	natscale	type_code
448	Aba Tenna D. Yil...	DIR	terminal	HADR	DIR	http://en.wikiped...	20.000	2
21	Abdul Rachman S...	MLG	ramp	WARA	MLG	http://en.wikiped...	8.000	2
626	Abidjan Port Bouet	ABJ	terminal	DIAP	ABJ	http://en.wikiped...	50.000	2
554	Abu Dhabi Int'l	AUH	terminal	OMAA	AUH	http://en.wikiped...	20.000	3
565	Abuja Int'l	ABV	terminal	DNAA	ABV	http://en.wikiped...	30.000	3
193	Achmad Yani	SRG	terminal	WARS	SRG	http://en.wikiped...	10.000	2
23	Adampur	VIAX	runway	VIAX	NULL	NULL	8.000	2
631	Adelaide Int'l	ADL	terminal	YPAD	ADL	http://en.wikiped...	50.000	2
333	Aden Adde Int'l	MGQ	runway	HCMM	MGQ	http://en.wikiped...	15.000	2
630	Aden Int'l	ADE	terminal	OYAA	ADE	http://en.wikiped...	50.000	2
417	Adnan Menderes	ADB	terminal	LTBJ	ADB	http://en.wikiped...	20.000	3
378	Aeroport Tunis	TUN	terminal	DTTA	TUN	http://en.wikiped...	15.000	3
805	Aeroportul Natio...	BBU	terminal	LRBS	BBU	http://en.wikiped...	75.000	2
784	Afonso Pena Int'l	CWB	terminal	SBCT	CWB	http://en.wikiped...	50.000	2
271	military	AGR	runway	VIAG	AGR	http://en.wikiped...	10.000	3
3	Ahwaz	AWZ	terminal	OIAW	AWZ	http://en.wikiped...	8.000	2
529	Albany Int'l	ALB	terminal	KALB	ALB	http://en.wikiped...	20.000	2
290	Albenga	ALL	ramp	LIMG	ALL	http://en.wikiped...	15.000	2
423	Albuquerque Int'l	ABQ	terminal	KABQ	ABQ	http://en.wikiped...	20.000	3
634	Aleppo Int'l	ALP	terminal	OSAP	ALP	http://en.wikiped...	50.000	3
659	Alfonso Bonilla Ar...	CLO	terminal	SKCL	CLO	http://en.wikiped...	50.000	2
261	Alicante	ALC	terminal	LEAL	ALC	http://en.wikiped...	10.000	3
52	Alice Springs	ASP	terminal	YBAS	ASP	http://en.wikiped...	10.000	2

8. Now we will style the airports layer using the newly created `type_code` attribute. Right-click the `ne_10m_airports` layer and select Properties.



9. Select the Style tab in the Layer Properties dialog. Select Categorized style from the drop-down menu and choose `type_code` as the Column. Choose a color ramp of your choice and click Classify. Click OK to go back to the main QGIS window.



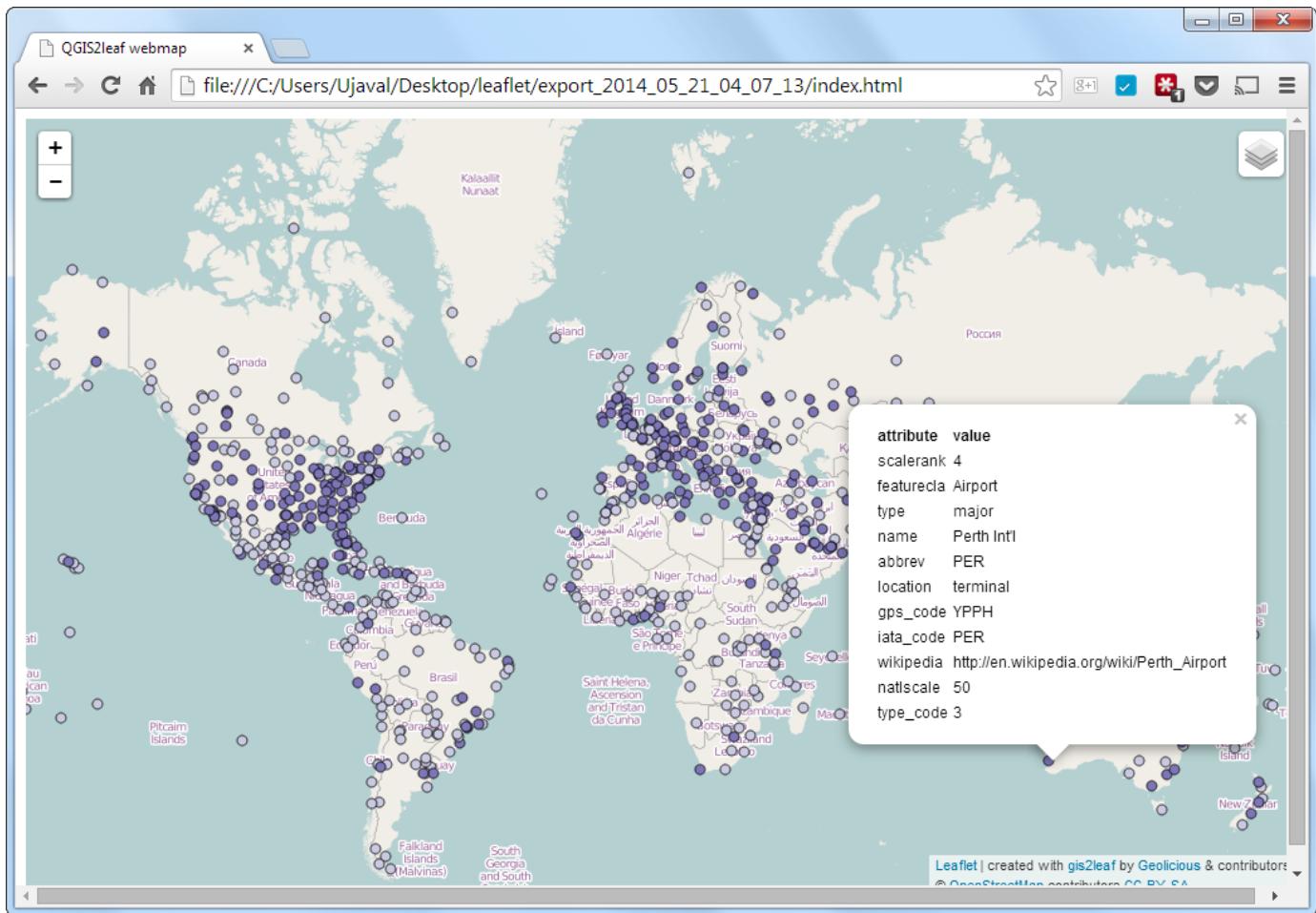
10. Here you will see a nicely styled airport map. Let's export this to create an interactive web map. Go to Web > qgis2leaf > Exports a QGIS Project to a working leaflet webmap.



11. In the QGIS 2 Leaflet dialog, click Get Layers to get the refreshed layer list. Select the Full screen option to have a full screen web map. Choose layer extent as the Extent of the exported map. Choose a Output project folder on your system where the plugin will write the output files. Click OK.



12. Once the export process finishes, locate the output folder on your disk. Open the `index.html` file in a browser. You will see an interactive web map that is a replica of the QGIS map. You can zoom and pan around the map and also click on any feature to get an popup window with attribute information. You can copy the contents of this folder to a web server to have a full featured web map.



- Now we will explore some advanced features of this plugin that will allow you to customize the map further. If you noticed, the popup contained all the attributes of the feature. Some attributes are not very useful and overall the pop up looks ugly. We can replace the default popup with our own custom HTML to make it much better. This is achieved by added the custom HTML in a column named `html_exp`. Right-click the `ne_10m_airports` layer and select Open Attribute Table.



14. In the attribute table dialog, click the Toggle Editing button. Once the layer is in editing mode, click the Open Field Calculator button.

	scalarank	featuredfa	type	name	gps_code	iata_code	wiki
0	9	Airport	small	Sahnewal	LUH	terminal	VILD
1	9	Airport	mid	Solapur	SSE	terminal	VASL
2	9	Airport	mid	Birsra Munda	IXR	terminal	VERC
3	9	Airport	mid	Ahwaz	AWZ	terminal	OIAW
4	9	Airport	mid and military	Gwalior	GWL	terminal	VIGR
5	9	Airport	mid	Hodeidah Int'l	HOD	terminal	OYHD
6	9	Airport	mid	Devi Ahilyabai Ho...	IDR	terminal	VAID
7	9	Airport	mid	Gandhinagar	ISK	ramp	VANR
8	9	Airport	major and military	Chandigarh Int'l	IXC	terminal	VICG
9	9	Airport	mid	Aurangabad	IXU	terminal	VAAU
10	9	Airport	mid and military	Faisalabad Int'l	LYP	terminal	OPFA
11	9	Airport	mid	Omsk Tsentralny	OMS	terminal	UNOO
12	9	Airport	mid	Novosibirsk Tolm...	OVB	terminal	UNNT
13	9	Airport	mid and military	Zaporozhye Int'l	OZH	runway	UKDE
14	9	Airport	mid	Simpang Tiga	PKU	terminal	WIBB
15	9	Airport	mid	Rota Int'l	ROP	terminal	PGRO
16	9	Airport	mid	Surgut	SGC	terminal	USRR
17	9	Airport	mid	Tiruchirappalli	TRZ	terminal	VOTR
18	9	Airport	mid	Turbat Int'l	TUK	terminal	OPTU
19	9	Airport	mid	Quetta Int'l	UET	terminal	OPQT
20	9	Airport	mid	Zahedan Int'l	ZAH	terminal	OIZH
21	9	Airport	mid and military	Abdul Rachman S...	MLG	ramp	WARA
22	9	Airport	mid	Barnaul	BAX	ramp	UNBB

15. Check the Create a new field box and enter `html_exp` as the Output field name. Choose Text (string) as the Output field type. Since we will be creating a long HTML string, choose 200 as the Output field width. Enter the following expression in the Expression area. The complex-looking expression simply defines a HTML table and substitutes cell values from attributes `iata_code`, `name` and `type`. Check the Output preview to ensure the expression is correct.

```
concat('<h3>', "iata_code", '</h3><table>', '<tr><td>Airport Name: <b> ',  
"name", '</b></td></tr><tr><td>Category: <b> ', "type",  
'</b></td></tr></table>')
```

### Note

The shapefile format can contain a maximum of 254 characters in a field. If you want to store longer text in the field, choose another format.



16. Back in the Attribute Table window, you will see a new column at the end. Verify that your expression worked correctly and click the Toggle Editing button to save the changes.

Attribute table - ne\_10m\_airports :: Features total: 891, filtered: 891, selected: 0

	location	gps_code	iata_code	wikipedia	natscale	type_code	html_exp
0	LUH	terminal	VILD	LUH	http://en.wikiped...	8.000	1 <h3>LUH</h3>...
1	SSE	terminal	VASL	SSE	http://en.wikiped...	8.000	2 <h3>SSE</h3>...
2	IXR	terminal	VERC	IXR	http://en.wikiped...	8.000	2 <h3>IXR</h3>...
3	AWZ	terminal	OIAW	AWZ	http://en.wikiped...	8.000	2 <h3>AWZ</h3>...
4	GWL	terminal	VIGR	GWL	http://en.wikiped...	8.000	2 <h3>GWL</h3>...
5	Int'l	terminal	OYHD	HOD	http://en.wikiped...	8.000	2 <h3>HOD</h3>...
6	bai Ho...	terminal	VAID	IDR	http://en.wikiped...	8.000	2 <h3>IDR</h3>...
7	ISK	ramp	VANR	ISK	http://en.wikiped...	8.000	2 <h3>ISK</h3>...
8	Int'l	terminal	VICG	IXC	http://en.wikiped...	8.000	3 <h3>IXC</h3>...
9	IXU	terminal	VAAU	IXU	http://en.wikiped...	8.000	2 <h3>IXU</h3>...
10	Int'l	terminal	OPFA	LYP	http://en.wikiped...	8.000	2 <h3>LYP</h3>...
11	ralny	terminal	UNOO	OMS	http://en.wikiped...	8.000	2 <h3>OMS</h3>...
12	Tolm...	terminal	UNNT	OVB	http://en.wikiped...	8.000	2 <h3>OVB</h3>...
13	Int'l	runway	UKDE	OZH	http://en.wikiped...	8.000	2 <h3>OZH</h3>...
14	PKU	terminal	WIBB	PKU	http://en.wikiped...	8.000	2 <h3>PKU</h3>...
15	ROP	terminal	PGRO	ROP	http://en.wikiped...	8.000	2 <h3>ROP</h3>...
16	SGC	terminal	USR	SGC	http://en.wikiped...	8.000	2 <h3>SGC</h3>...
17	alli	terminal	VOTR	TRZ	http://en.wikiped...	8.000	2 <h3>TRZ</h3>...
18	TUK	terminal	OPTU	TUK	http://en.wikiped...	8.000	2 <h3>TUK</h3>...
19	UET	terminal	OPQT	UET	http://en.wikiped...	8.000	2 <h3>UET</h3>...
20	ZAH	terminal	OIZH	ZAH	http://en.wikiped...	8.000	2 <h3>ZAH</h3>...
21	man S...	ramp	WARA	MLG	http://en.wikiped...	8.000	2 <h3>MLG</h3>...
22	BAX	ramp	UNBB	BAX	http://en.wikiped...	8.000	2 <h3>BAX</h3>...

17. Now export the map again using Web ▶ qgis2leaf ▶ Exports a QGIS Project to a working leaflet webmap.



18. Choose the options as before.



19. Go to the output folder once the export process finishes. You will have a subfolder with the present timestamp. Locate the index.html file inside it and open it in a browser. Click on any feature and look at the popup. You will notice that it looks a lot cleaner and informative.



20. Another useful feature of the `qgis2leaf` plugin is the ability to specify a custom icon to use with the web map. This is accomplished by specifying the path to the custom icon in a field called `icon_exp`. We will create a new layer containing only the major airports and style using a custom SVG icon. Locate the Select features using an expression tool from the toolbar.



21. Enter the expression below and press Select to select all major airports.

```
"type_code" = 3
```



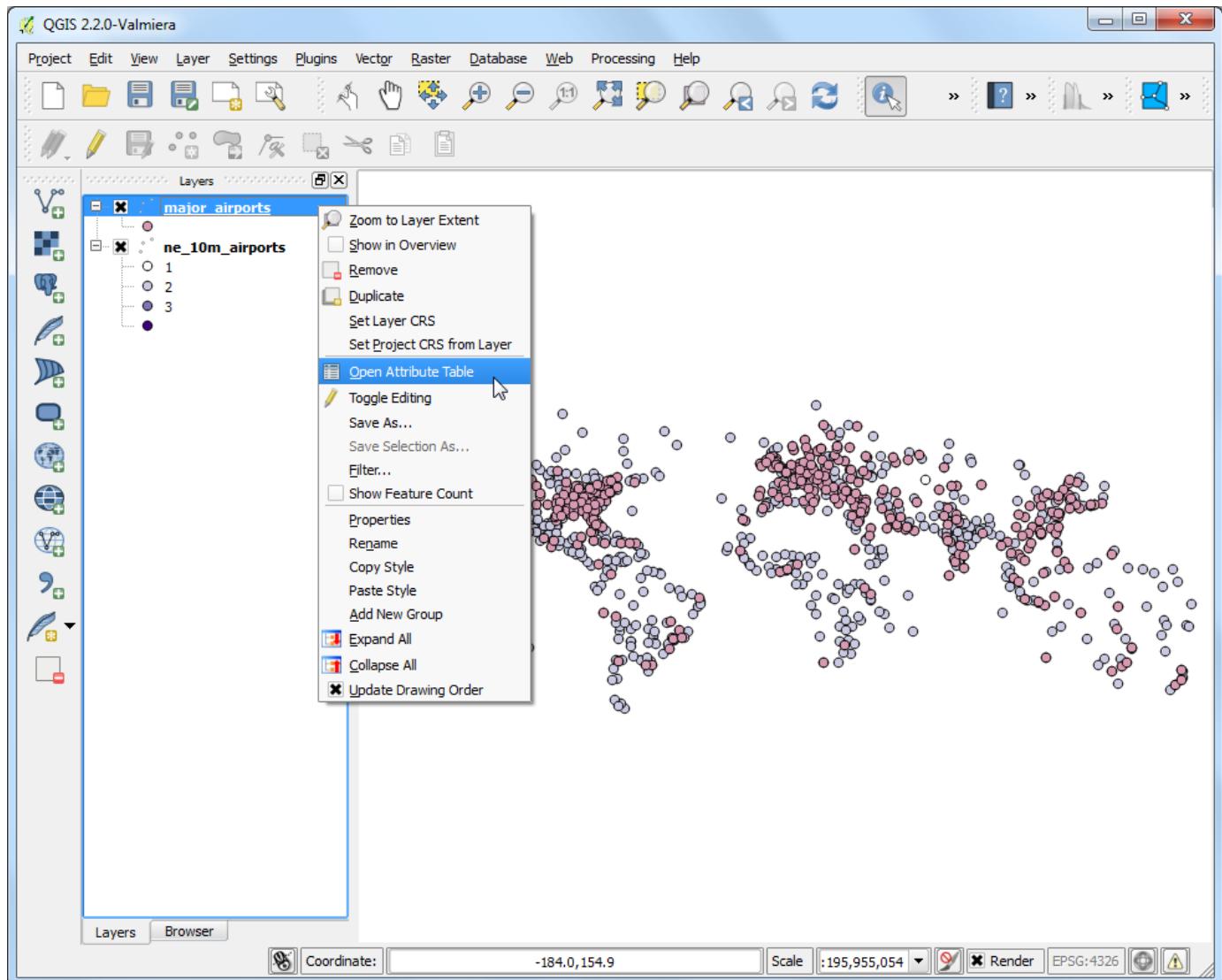
22. Right-click the `ne_10m_airports` airports and select Save Selection As....



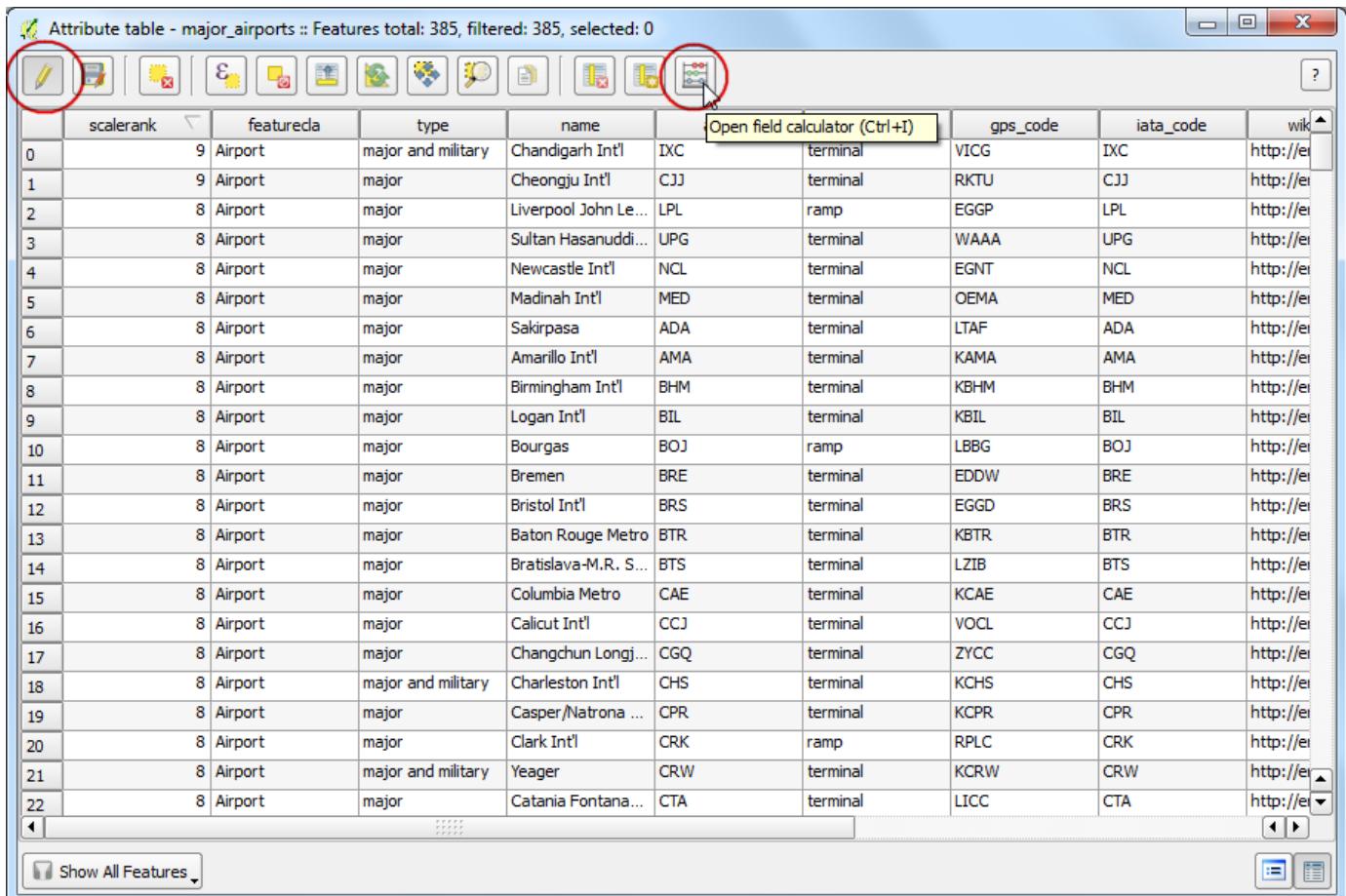
23. In the Save vector layer as... dialog, name the output file as major\_airports.shp. Check the Add saved file to map and click OK.



24. Once the `major_airports` layer is loaded in QGIS, right-click it and select Open Attribute Table.



25. In the attribute table dialog, click the Toggle Editing button. Once the layer is in editing mode, click the Open Field Calculator button.



Attribute table - major\_airports :: Features total: 385, filtered: 385, selected: 0

	scalerank	featurecla	type	name		Open field calculator (Ctrl+I)	gps_code	iata_code	wikidata
0	9	Airport	major and military	Chandigarh Int'l	IXC	terminal	VICG	IXC	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
1	9	Airport	major	Cheongju Int'l	CJJ	terminal	RKTU	CJJ	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
2	8	Airport	major	Liverpool John Le... ...	LPL	ramp	EGGP	LPL	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
3	8	Airport	major	Sultan Hasanuddi...	UPG	terminal	WAAA	UPG	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
4	8	Airport	major	Newcastle Int'l	NCL	terminal	EGNT	NCL	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
5	8	Airport	major	Madinah Int'l	MED	terminal	OEMA	MED	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
6	8	Airport	major	Sakirpasa	ADA	terminal	LTAF	ADA	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
7	8	Airport	major	Amarillo Int'l	AMA	terminal	KAMA	AMA	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
8	8	Airport	major	Birmingham Int'l	BHM	terminal	KBHM	BHM	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
9	8	Airport	major	Logan Int'l	BIL	terminal	KBIL	BIL	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
10	8	Airport	major	Bourgas	BOJ	ramp	LBBG	BOJ	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
11	8	Airport	major	Bremen	BRE	terminal	EDDW	BRE	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
12	8	Airport	major	Bristol Int'l	BRS	terminal	EGGD	BRS	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
13	8	Airport	major	Baton Rouge Metro	BTR	terminal	KBTR	BTR	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
14	8	Airport	major	Bratislava-M.R. S...	BTS	terminal	LZIB	BTS	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
15	8	Airport	major	Columbia Metro	CAE	terminal	KCAE	CAE	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
16	8	Airport	major	Calicut Int'l	CCJ	terminal	VOCL	CCJ	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
17	8	Airport	major	Changchun Longj...	CGQ	terminal	ZYCC	CGQ	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
18	8	Airport	major and military	Charleston Int'l	CHS	terminal	KCHS	CHS	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
19	8	Airport	major	Casper/Natrona ...	CPR	terminal	KCPR	CPR	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
20	8	Airport	major	Clark Int'l	CRK	ramp	RPLC	CRK	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
21	8	Airport	major and military	Yeager	CRW	terminal	KCRW	CRW	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>
22	8	Airport	major	Catania Fontana...	CTA	terminal	LICC	CTA	<a href="http://en.wikipedia.org">http://en.wikipedia.org</a>

26. In Field Calculator dialog, enter `icon_exp` as the Output field name. Make it a Text (string) type. In the Expression area, enter the following expression.

```
'airport.svg'
```



27. Save your edits by clicking the Toggle Editing button in the Attribute Table.

	id	location	gps_code	iata_code	wikipedia	natlscaler	type_code	html_exp	icon_exp
0		terminal	VICG	IXC	http://en.wikiped...	8.000	3	<h3>IXC</h3>...	airport.svg
1		terminal	RKTU	CJJ	http://en.wikiped...	8.000	3	<h3>CJJ</h3>...	airport.svg
2		ramp	EGGP	LPL	http://en.wikiped...	10.000	3	<h3>LPL</h3>...	airport.svg
3		terminal	WAAA	UPG	http://en.wikiped...	10.000	3	<h3>UPG</h3>...	airport.svg
4		terminal	EGNT	NCL	http://en.wikiped...	10.000	3	<h3>NCL</h3>...	airport.svg
5		terminal	OEMA	MED	http://en.wikiped...	10.000	3	<h3>MED</h3>...	airport.svg
6		terminal	LTAF	ADA	http://en.wikiped...	10.000	3	<h3>ADA</h3>...	airport.svg
7		terminal	KAMA	AMA	http://en.wikiped...	10.000	3	<h3>AMA</h3>...	airport.svg
8		terminal	KBHM	BHM	http://en.wikiped...	10.000	3	<h3>BHM</h3>...	airport.svg
9		terminal	KBIL	BIL	http://en.wikiped...	10.000	3	<h3>BIL</h3><...	airport.svg
10		ramp	LBBG	BOJ	http://en.wikiped...	10.000	3	<h3>BOJ</h3>...	airport.svg
11		terminal	EDDW	BRE	http://en.wikiped...	10.000	3	<h3>BRE</h3>...	airport.svg
12		terminal	EGGD	BRS	http://en.wikiped...	10.000	3	<h3>BRS</h3>...	airport.svg
13		terminal	KBTR	BTR	http://en.wikiped...	10.000	3	<h3>BTR</h3>...	airport.svg
14		terminal	LZIB	BTS	http://en.wikiped...	10.000	3	<h3>BTS</h3>...	airport.svg
15		terminal	KCAE	CAE	http://en.wikiped...	10.000	3	<h3>CAE</h3>...	airport.svg
16		terminal	VOCL	CCJ	http://en.wikiped...	10.000	3	<h3>CCJ</h3>...	airport.svg
17		terminal	ZYCC	CGQ	http://en.wikiped...	10.000	3	<h3>CGQ</h3>...	airport.svg
18		terminal	KCHS	CHS	http://en.wikiped...	10.000	3	<h3>CHS</h3>...	airport.svg
19		terminal	KCPR	CPR	http://en.wikiped...	10.000	3	<h3>CPR</h3>...	airport.svg
20		ramp	RPLC	CRK	http://en.wikiped...	10.000	3	<h3>CRK</h3>...	airport.svg
21		terminal	KCRW	CRW	http://en.wikiped...	10.000	3	<h3>CRW</h3>...	airport.svg
22		terminal	LICC	CTA	http://en.wikiped...	10.000	3	<h3>CTA</h3>...	airport.svg

28. Open the `qgis2leaf` plugin from Web ▶ `qgis2leaf` ▶ Exports a QGIS Project to a working leaflet webmap. Click Get Layers button to fetch both the layers from QGIS. There are many different pre-made tile layers available for basemaps. In this map, we can try something different and load the Stamen Watercolor as the Basemap. Click OK.



29. If you remember we specified `airport.svg` as the icon for the airports. We need to add that icon manually to the output directory. QGIS comes with a large collection of icons. On Windows, these icons are located at `C:\OSGEO4W64\apps\qgis\svg`. The path may differ depending on your platform and install type. Locate that directory and choose an icon you like. For our map, we can try the `amenity=airport.svg` icon located under `transport` category.



30. Copy and paste this icon in the output directory you had specified when exporting the map. Rename it as `airport.svg`.



31. Now open the `index.html` file located in the folder. You will see a beautiful basemap with our custom icons for the major airports. Also notice the layer panel at top-right corner which has layer display control for both the layers.

