

Searching and Downloading OpenStreetMap Data

QGIS Tutorials and Tips



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Searching and Downloading OpenStreetMap Data

Getting high quality data is essential for any GIS task. One great resource for free and openly licensed data is [OpenStreetMap\(OSM\)](#). The OSM database consists of streets, local data as well as building polygons. Getting access to OSM data in a GIS format is integrated in QGIS. This tutorial explains the process for searching, downloading and using OSM data in QGIS.

Overview of the task

Search for *London* in OSM database, browse and select a part of the city, and extract all pub locations as a shapefile.

Procedure

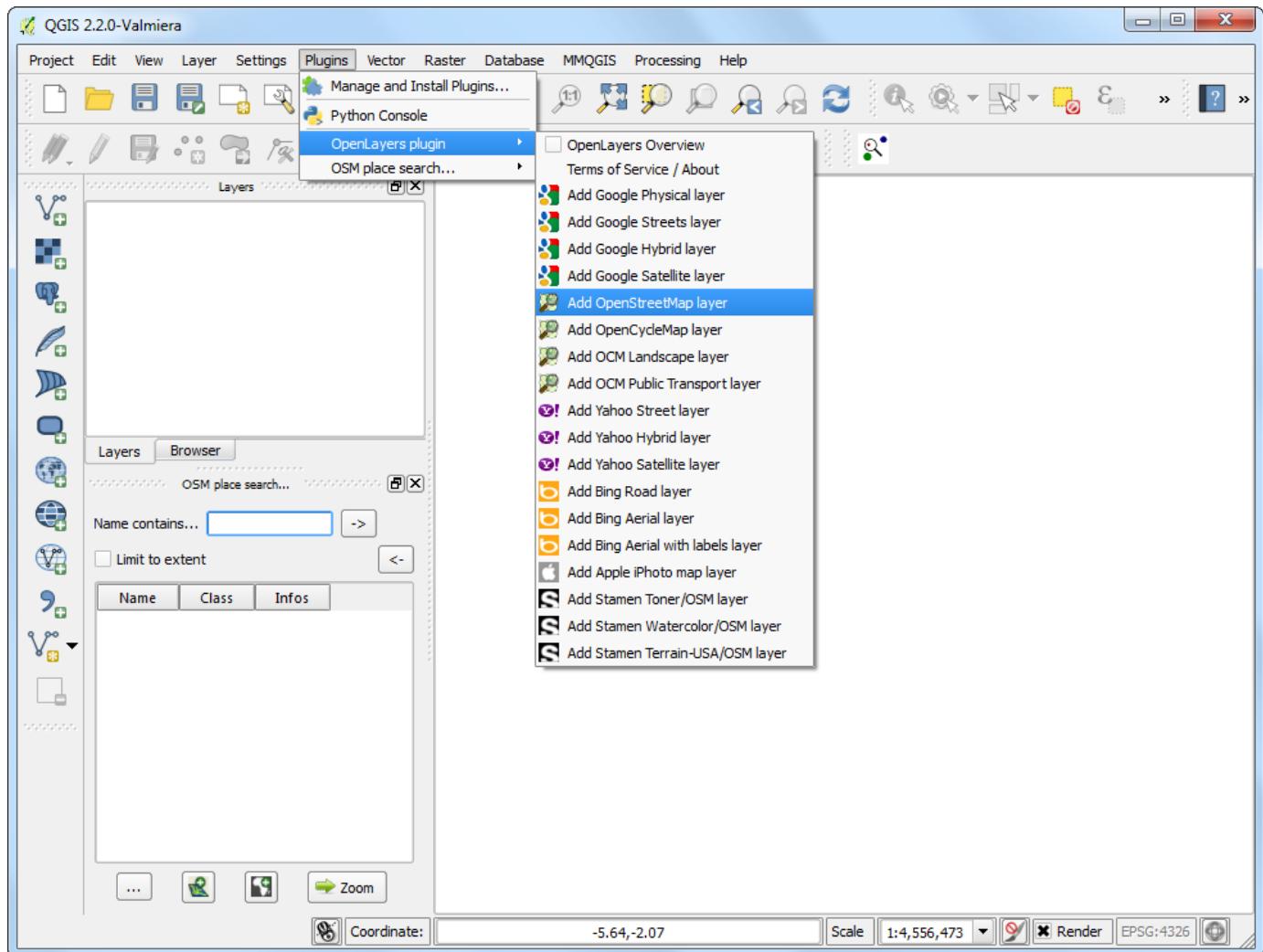
1. We will use 2 plugins to accomplish the task. Make sure you have installed **OSM Place Search** and **OpenLayers** plugins. See [Using Plugins](#) for instructions on downloading plugins.



2. The **OSM Place Search** plugin will install itself as a *Panel* in QGIS. You will see a new panel titled **OSM place search...** in QGIS.



3. The **OpenLayers** plugin is installed under the *Plugin* menu. This plugin allows you to access basemaps from various providers in QGIS. Let's load the OpenStreetMap basemap in QGIS by going to *Plugins* ▶ *OpenLayers* plugin ▶ *Add OpenStreetMap layer*.



4. You will see a world map loaded in QGIS.

Note

If you do not see any data - make sure you are online - as the basemap tiles are fetched from the internet. You can also use the *Pan* tool to move the map canvas slightly, which will trigger a refresh of the basemap.



5. Now, let's search for *London*. Type the query in the Name contains... box in the **OSM Place Search** panel. You can hover over the results and the appropriate place will be highlighted on the map. Select the first result - which is the city of London in UK - and click the Zoom button.



6. You will see the base layer move and center around the city of London. You can use the Zoom tool to zoom and select the exact area of your interest. For this tutorial, you can zoom in the center of the city as shown.



7. Now we can download the data displayed on the map canvas. Go to Vector ▶ OpenStreetMap ▶ Download data.



8. In the Download OpenStreetMap data dialog, choose From map canvas as the Extent. Choose the path and name the output file as london.osm.



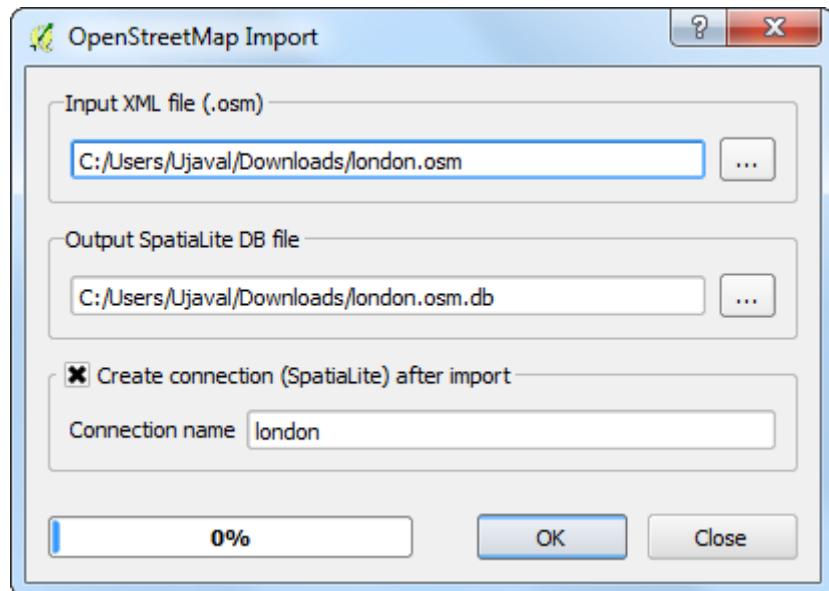
9. The downloaded file with the .osm extension is an text file in the OSM XML format. We first need to convert it into a suitable format that is easy to consume in QGIS. Go to Vector > OpenStreetMap > Import topology from XML.

Note

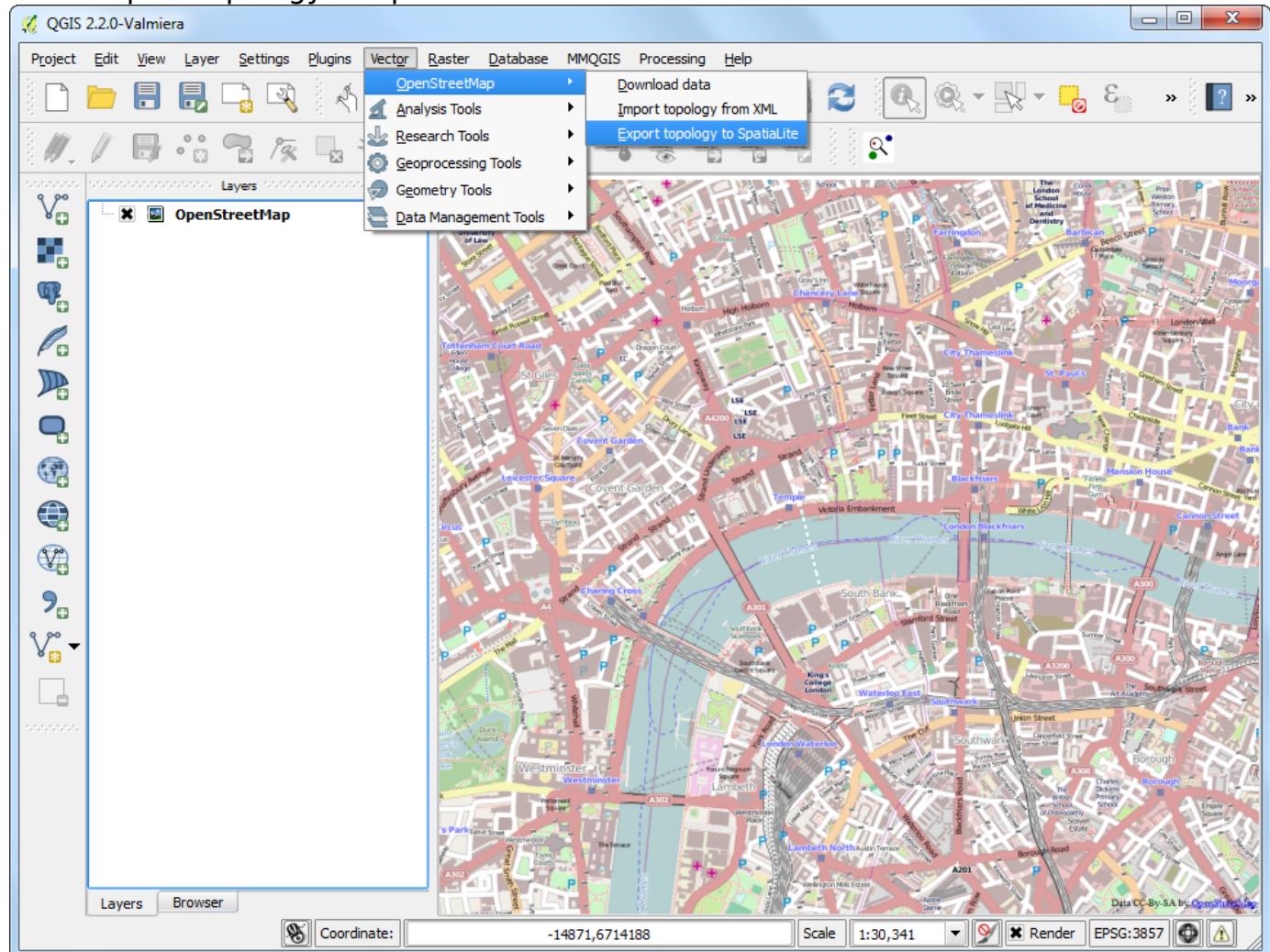
Now that we do not need the **OSM Place Search** functionality, you can click the close button to remove it from the main window. If you need to use it again, you can enable it from View > Panels > OSM place search... (Windows) or Settings > Panels > OSM place search... (Linux).



10. Choose the downloaded london.osm as the Input XML file. Name the Output SpatiaLite DB file as london.osm.db. Make sure the Create connection (SpatiaLite) after import button is checked.



11. Now the last step. We need to create SpatialLite geometry layers that can be viewed and analyzed in QGIS. This is done using Vector > OpenStreetMap > Export topology to SpatialLite.



12. The london.osm.db file contains all feature types in the OSM database - Points, Lines and Polygons. GIS layers typically contain only one type of feature, so you need to choose one. Since we are interested in point locations of pubs, here you need to choose Point (nodes) as the Export type. You would

choose Polyline (open ways) if you wanted to get the road network. Name the Output layer name as london_points. GIS data has 2 parts to it - location and attributes. We are also interested in the **name** of the pub - not just its location, so we need to export that information as well. Click on Load from DB under Exported tags section. This will fetch all attributes from the london.osm.db file. Check name and amenity tags. See [OSM Tags](#) to learn more about what each attribute means. Make sure the Load into canvas when finished is checked, and click OK.



13. You will see a new point layer named london_points loaded in QGIS. Note that this contains **ALL** points in the OSM database for the viewport. Since we are interested only in pubs, we need to write a query to select only those. Right click on london_points layer and select Open Attribute Table.



14. You will note that some features have the attribute value of **pubs** listed under the amenity column. Click on Select features using an expression button.

Attribute table - london_points :: Features total: 40509, filtered: 40509, selected: 0

The screenshot shows the QGIS Attribute Table for the 'london_points' layer. The table has three columns: 'id', 'name', and 'amenity'. The 'amenity' column contains values like 'NULL', 'bicycle_parking', 'restaurant', 'pub', and 'telephone'. A red box highlights the row for feature 2708, which has 'name' = 'The Hartley' and 'amenity' = 'pub'. The 'Select' button in the toolbar is also circled in red.

	id	Select features using an expression	
2699	286509353	NULL	NULL
2700	286509354	NULL	bicycle_parking
2701	286509355	The co-operative...	NULL
2702	286509356	Sanh Hing	restaurant
2703	286509357	Tower Tandoori	restaurant
2704	286719841	The Langley	pub
2705	287156192	NULL	bicycle_parking
2706	287156193	NULL	bicycle_parking
2707	287238064	NULL	telephone
2708	287240464	The Hartley	pub
2709	287243496	Huntsman and H...	pub
2710	287244243	NULL	NULL
2711	287244753	NULL	NULL
2712	287246627	NULL	NULL
2713	287246751	NULL	NULL
2714	287247280	NULL	NULL
2715	287247568	NULL	bicycle_parking
2716	287438189	NULL	NULL
2717	287438202	NULL	bicycle_parking
2718	287438204	NULL	post_box
2719	287439204	NULL	NULL
2720	287442502	Heeltap Wine Bar	pub
2721	287442510	NULL	NULL
2722	287447182	NULL	NULL

Show All Features

15. Enter the expression "amenity" = 'pub' and click Select.

Select By Expression

The screenshot shows the 'Select By Expression' dialog. In the 'Expression' field, the text "'amenity' = 'pub'" is entered, with the entire expression highlighted by a red box. The dialog includes sections for 'Function list', 'Selected function help', 'Field' (with a sub-section 'Field values'), 'Operators', and 'Output preview'.

Function list

Selected function help

Field

Double click to add field name to expression string.
Right-Click on field name to open context menu sample value loading options.

Field values

Load values all unique 10 samples

Operators

= + - / * ^ || ()

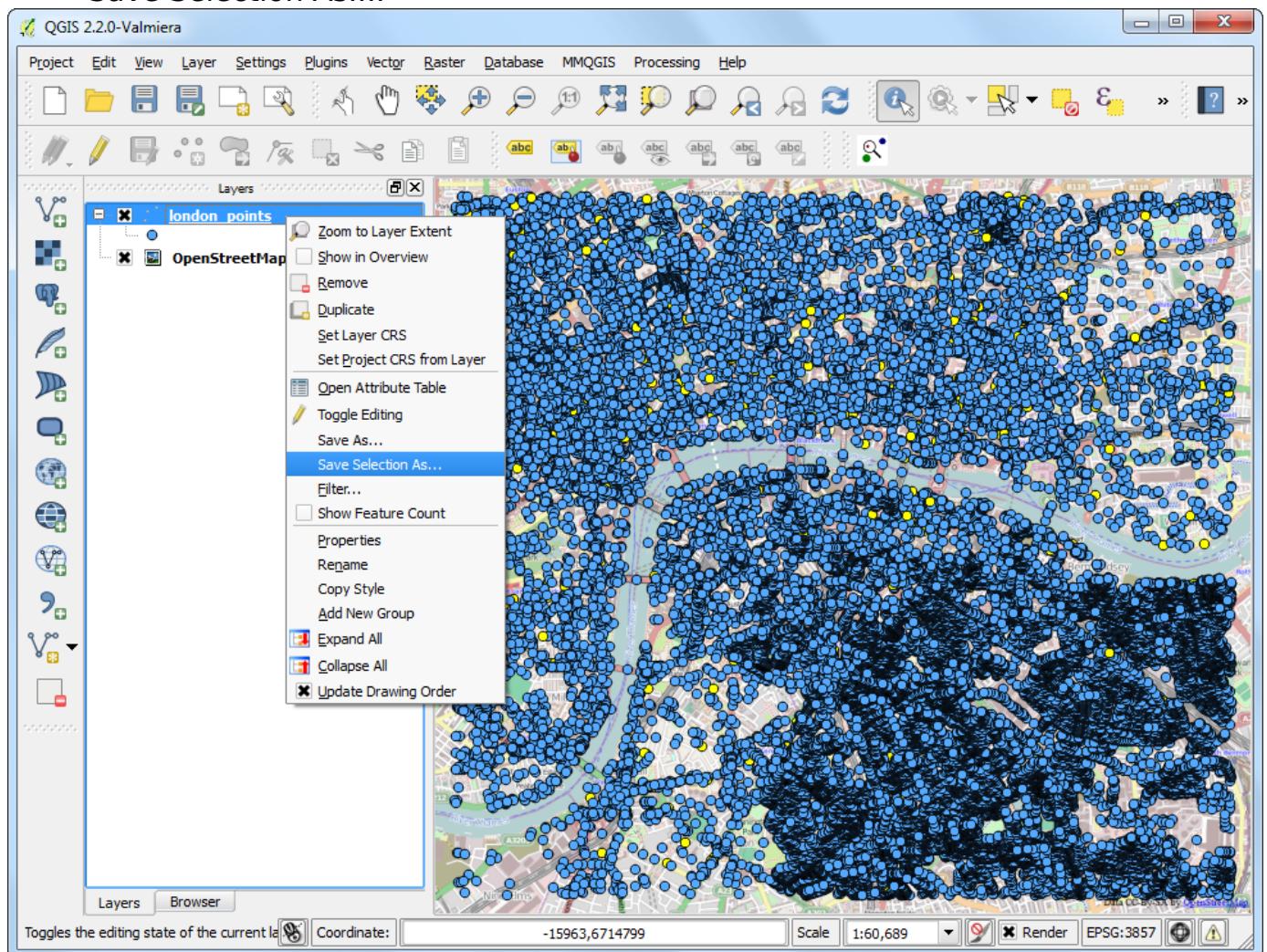
Expression

'amenity' = 'pub'

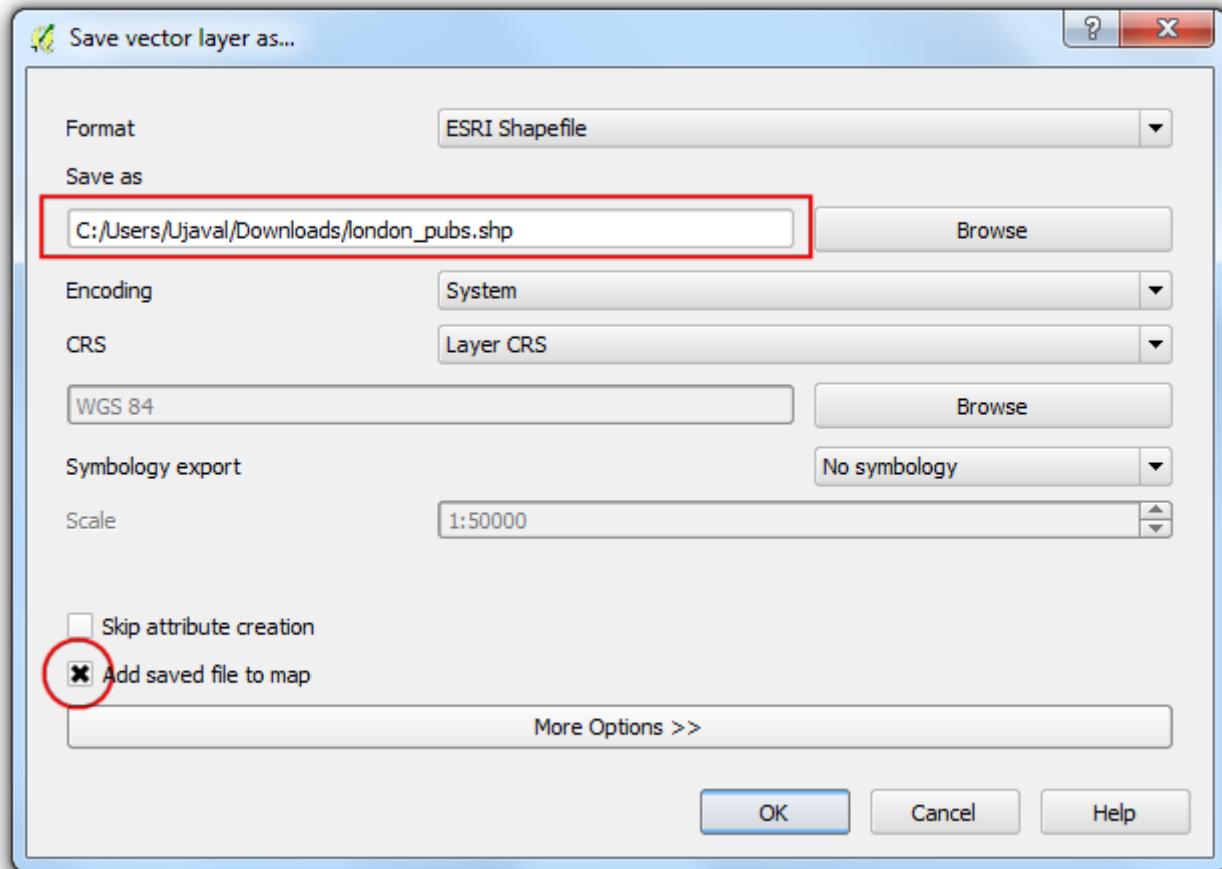
Output preview:

Select Close

16. Back in the QGIS Canvas, you will see some points highlighted in yellow. These are the result of our query. Right-click the `london_points` layer and choose Save Selection As....



17. In the Save vector layer as... dialog, enter the name of the output file as `london_pubs.shp`. Leave all other options as they are and make sure the Add saved file to map option is checked. Click OK.



18. You will see a new layer named `london_pubs` in the QGIS canvas. Uncheck the `london_points` layer as we don't need that anymore.



19. The extraction of the pubs shapefile layer is now complete. You can use the Identify tool to click on any of the point as see its attributes.

