

Laboratory Exercise Report – 9

Open Layers and Web Mapping

Objective

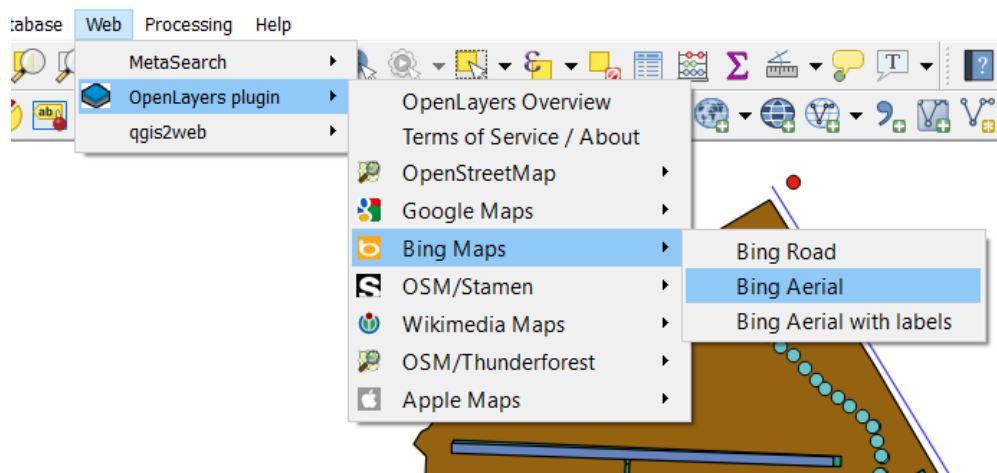
This laboratory exercise aims to learn the basics of Web Mapping, to get familiar with OpenLayers and Leaflet, & to create layers from Base maps offered by OpenStreetMap, Google Maps or Bing Maps.

Software & Data

- Open source QGIS Software with OpenLayers and qgis2web plugins.
- The coordinate reference system of the given data is EPSG:32644.
- Nine layers: Boundary, Building, Landmark, Landuse, Pole, Railway, Road, Walkway and Water.

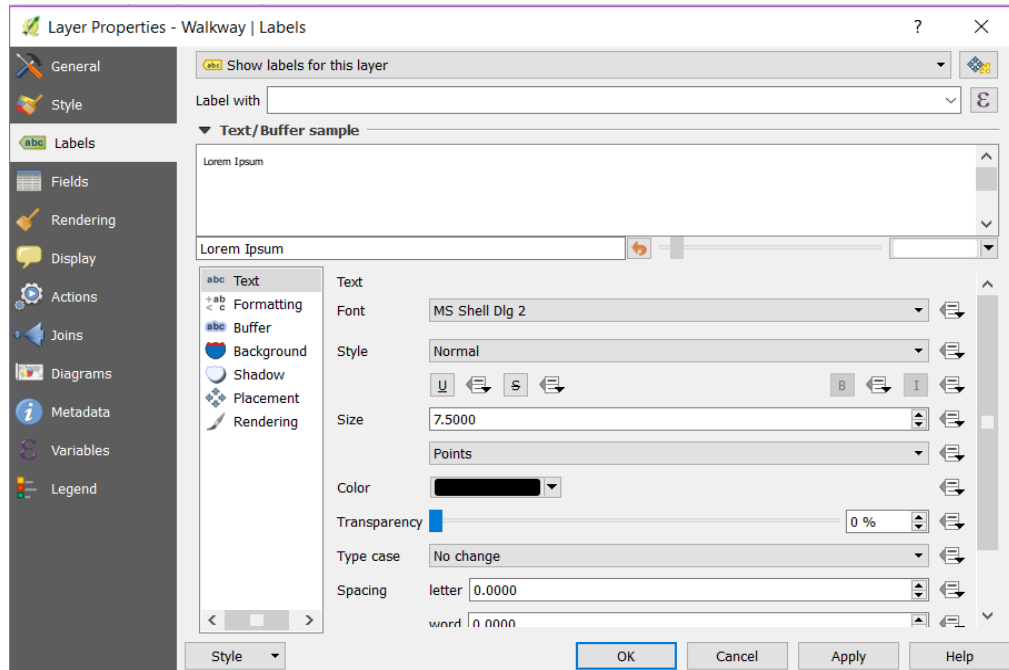
Methodology

1. Install two QGIS plugins – OpenLayers and qgis2web, to build a web map. (**Plugins-> Search and install them**).
2. Import all the given nine layers: Boundary, Building, Landmark, Landuse, Pole, Railway, Road, Walkway and Water.
3. Add Base Map: Web->OpenLayers plugin offers the list of sources – OpenStreetMap, Google Maps, Bing Maps etc., from where you can add the base map to the imported layers. (Web->OpenLayers plugin -> Bing Maps -> Bing Aerial), It will add new layer into the project.

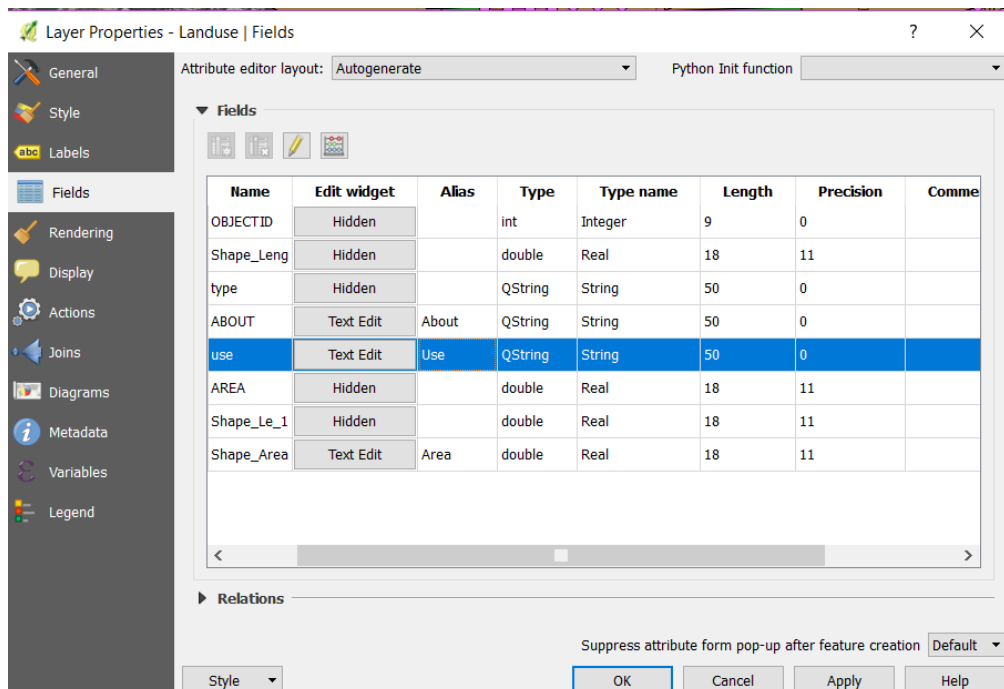


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4. This base map can be used to create new layers of interest. Using the base map, we will create some layers (point, line and polygon), Airstrip – polygon, Hall III as polygon, etc.
5. We can change the symbols and labels of the layers as per our requirement by opening the property dialogue box and in the Labels tab & Style Tab.

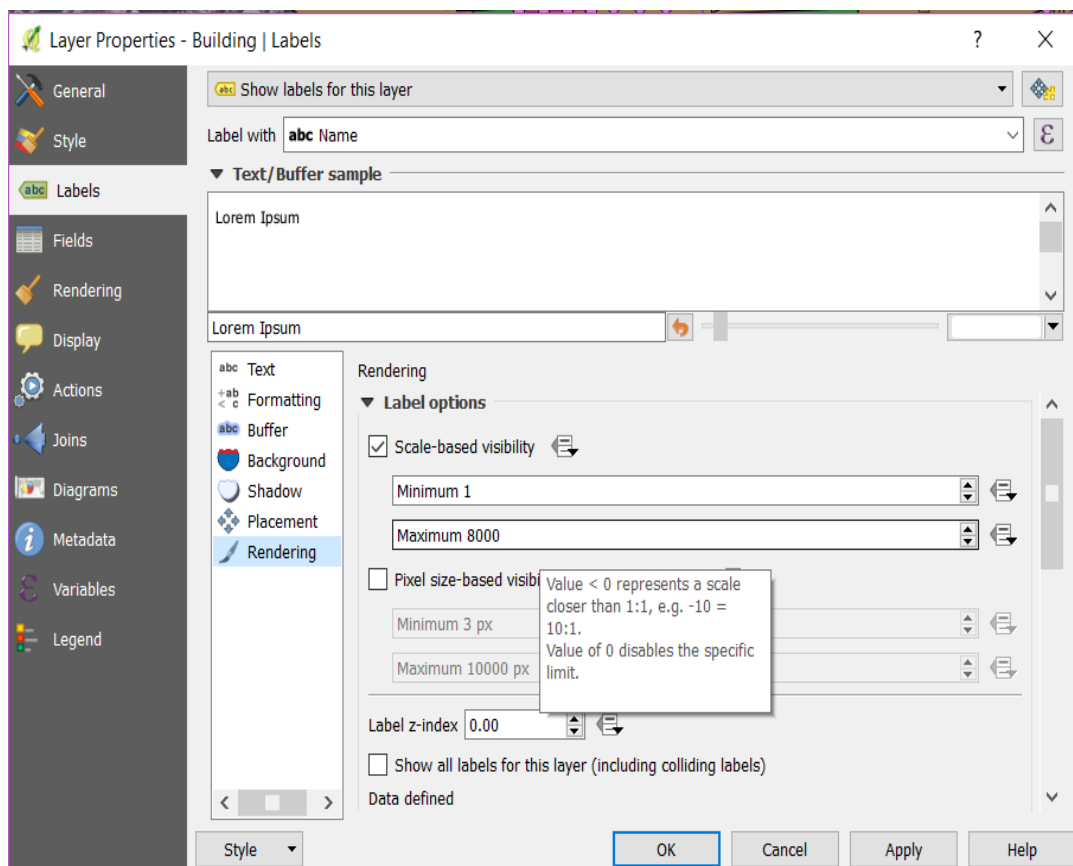


6. Open the Properties Window of the layer and switch to the Fields tab. Some attributes aren't relevant to the users of our web map, so we can choose to hide these. In the Edit Widget Properties dialog, choose Hidden as the type. Click OK. Similarly set other fields to Hidden type. Select Web View as the field type. This type indicates that the value contained in this field is a URL.



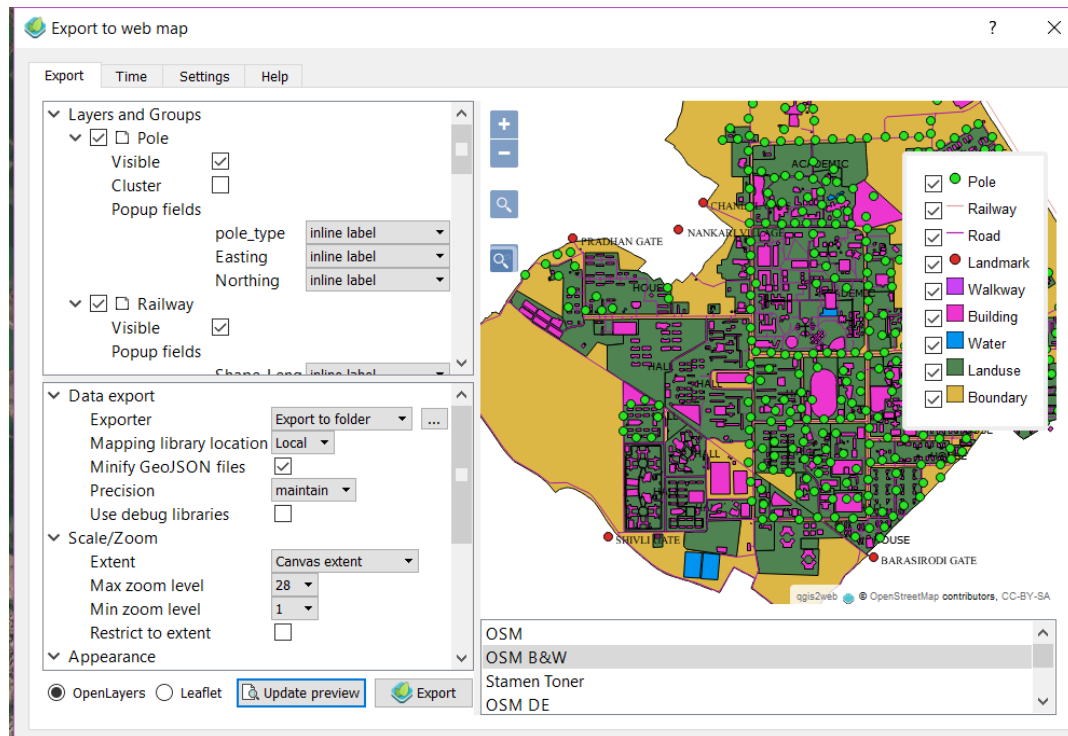
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7. We can also use the Alias column to indicate an alternate name for the fields without actually changing the underlying data table. This is useful to give more user-friendly field names to our map users. Add aliases as per your choices and click Ok.
8. For a complete map, we also need to label. Switch to the Labels tab in the Properties dialog. Select “**Show labels for this layer**” and choose “Name” as the value for Label with.
9. We will also set the Rendering option so that the labels only appear when the user is sufficiently zoomed in. Check “**Scale-based visibility**” under Label options. Enter 1 as the Minimum scale and 150000 as the maximum scale. This setting will render the labels only after the user has zoomed in more than the 1:150000 scale and will be visible till the 1:1 scale



10. There are field types available that allow us to set how the fields appear to the users of our map.
11. Convert these designed layers as a web map by using qgis2web plugin. (Web->qgis2web->Create web map)

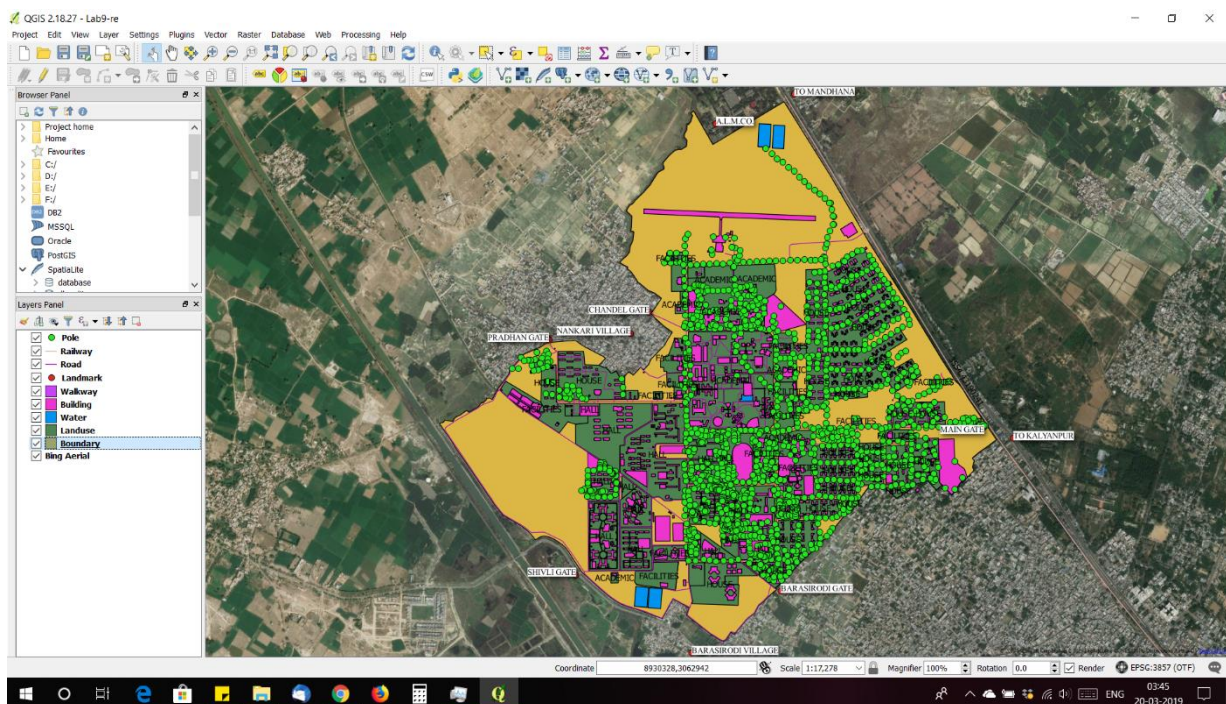
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12. It has many options, which help us to customize the web-map, layers & group-visibility, clusters & popup fields. It also has following options, Data Export, Precision, Scale/Zoom, add search bar, Geolocate user, Shows popup on hover, etc.

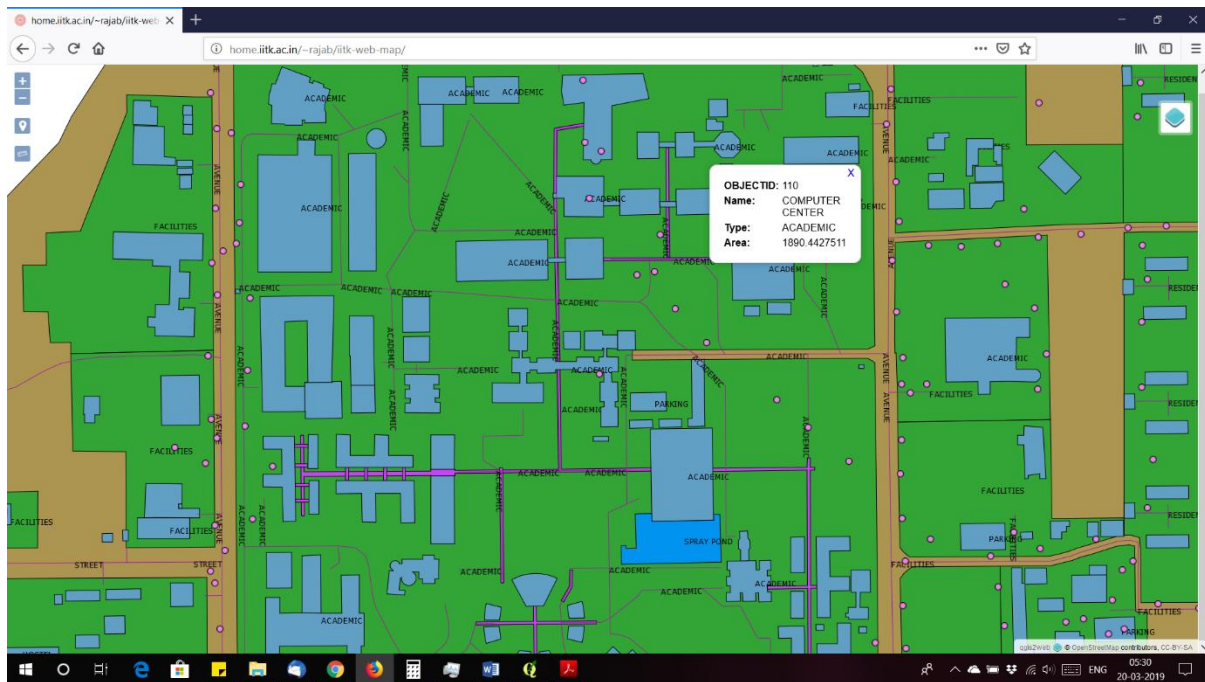
Results and Discussion

Map Created by OpenLayers :



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We have created web map from QGIS data base or attribute table. Many more features can be included as per need. I had Hidden the fields which was not required for web map, changed the visibility scale for the labels of the layers and many others.

The file type created by qgis2web plugin is for web interface. It has files with HTML codes along with CSS (Cascading Style Sheets), JS (JavaScript), XML (Extensible Markup Language), PNG Images. These file systems are used for transferring data over the network using HTTP or HTTPS protocols and displaying it on Web Browsers. Both OpenLayer & Leaflet create similar type of file system.

I had customised the map with all features provided by qgis2web plugin with proper symbols & labels like, included search option, included field measurement tool, included zoon in & out tool, included user geolocator tool, included collapsed info for all layers on map, included hover popup features, hidden the attributes which was of less importance, adjusted the visibility/ scale features for different labels.

Conclusions

I learned about creating web-map from QGIS database & attribute table using qgis2web plugin, learnt about OpenLayers & Leaflet etc.

References

- <https://openlayers.org>
- <https://leafletjs.com>
- https://www.qgistutorials.com/en/docs/web_mapping_with_qgis2web.html