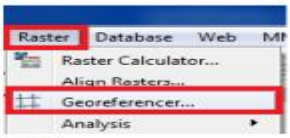
Prac 6

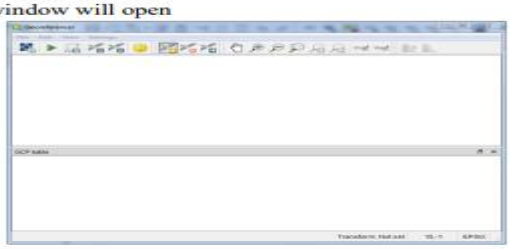
PRACTICAL - 6

- **Georeferencing**
  - **A. Georeferencing Topo Sheets and Scanned Maps**
  - Start a new project
  - Go to Layers → Add Layer → Add vector Layer
  - Select GIS_Workshop\Manual\Prac06\IND_adm0.shp
  - Zoom in to Mumbai region in the layer.

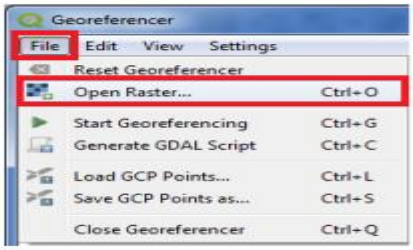
  - Go to Plugins→ Manage and Install Plugins
  - Ensure that  is checked, if not install Georeferencer GDAL plugin.
  - Go to Raster → Georefrencer



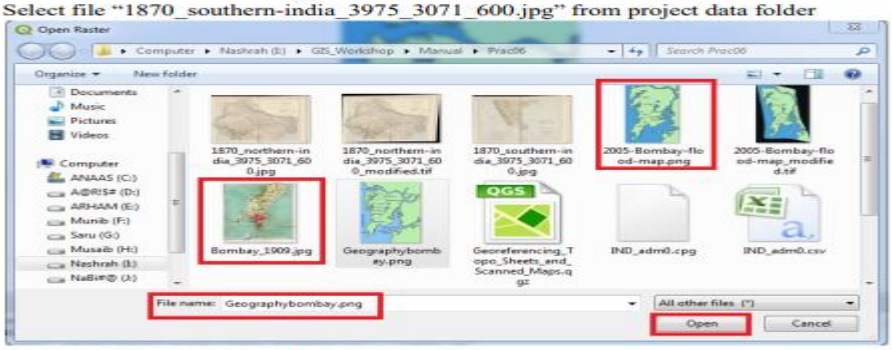
  - A new Georeferencer window will open



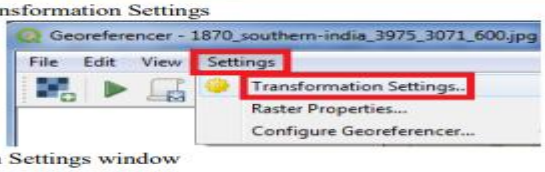
  - File → Open Raster



  - Select file "1870_southern-india_3975_3071_600.jpg" from project data folder



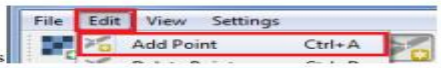
  - Go to Settings →Transformation Settings

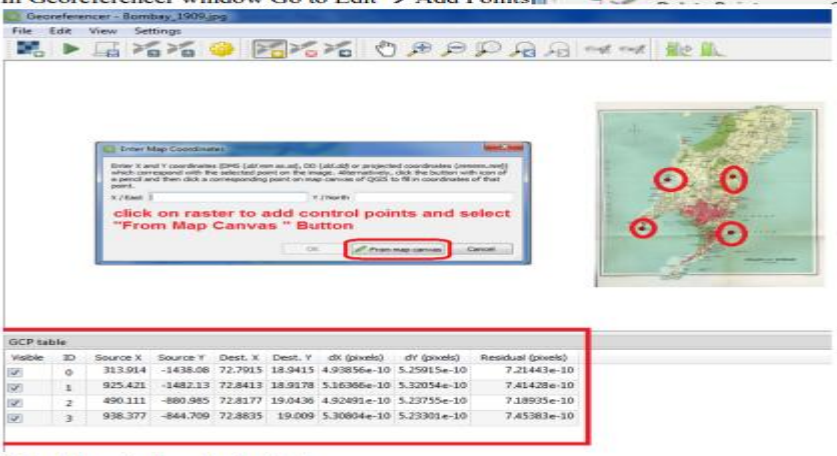


  - In the Transformation Settings window

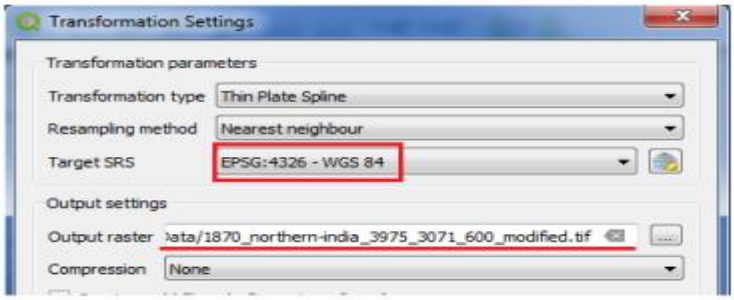
- Select Transformation type → Thin Plate Spline
- Re-sampling Method → Nearest Neighbour
- Target TRS → Everest 1830 datum: EPSG 4044
- Select Output Raster Name and Location
- Check the Load in QGIS When Done Option
- Press "OK".

➢ In Georeferencer window Go to Edit → Add Points



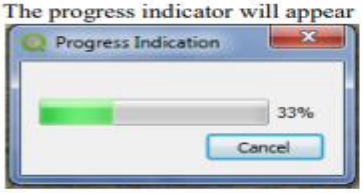


➢ Select the set of control points.
➢ Go to, Setting → transformation settings.

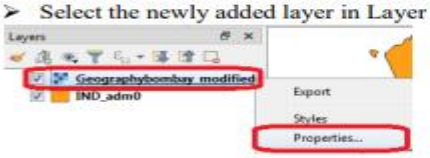


➢ Press "RUN"
➢ In Georeferencing window go to → File → Start Georeferencing

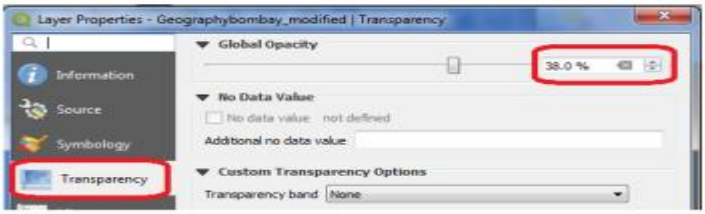
➢ The progress indicator will appear



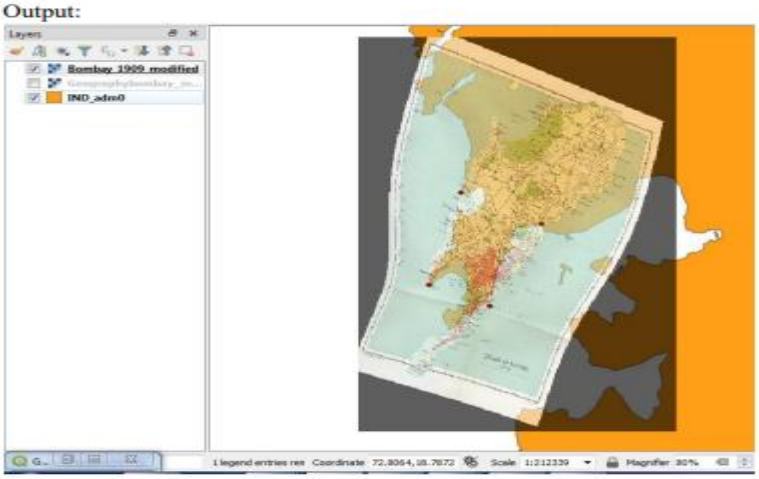
➢ The canvas area will now have the scanned map of Mumbai referenced with control points.
➢ Select the newly added layer in Layer Panel Right click and go to property.



➢ Set Transparency level of raster layer to appropriate level.



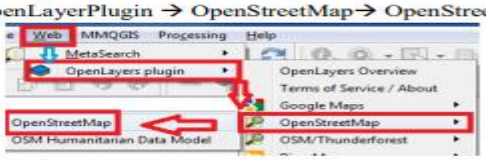
Output:



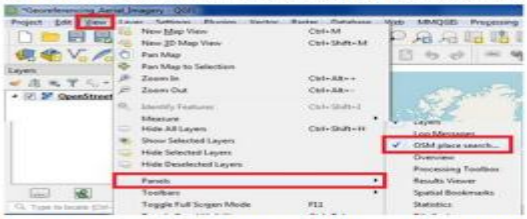
- The Scanned Image map coincides with the existing map.

B. Georeferencing Aerial Imagery

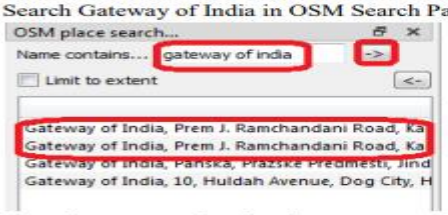
- Install plugin OpenStreetMap
- Go to Web Menu → OpenLayerPlugin → OpenStreetMap→ OpenStreetMap



- Go to Project → Properties → Set CRS to EPSG 3857
- Go to View → Panels → select OSM Place search

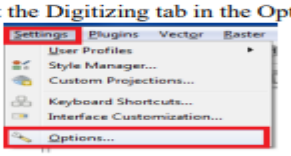


- The Gateway of India, Mumbai is located at 18.92°N 72.83°E
- Search Gateway of India in OSM Search Panel

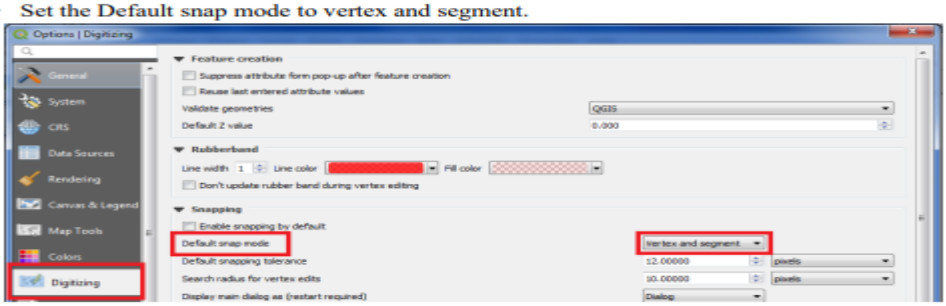


- Zoom in to appropriate level.
- The map will appear like this

- Click Build pyramids. Then click OK.
- Go to Settings →Options…. Select the Digitizing tab in the Options dialog.

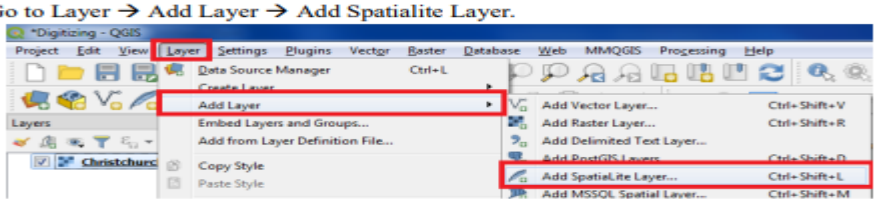


- Set the Default snap mode to vertex and segment.

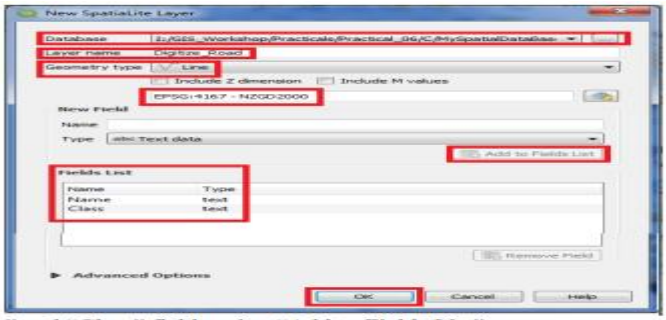


- Press OK.

- Go to Layer → Add Layer → Add Spatialite Layer.



- Select the name and location for Spatial database eg: "GIS_Workshop\Practicals\Practical_06\C\MySpatialDataBase.sqlite".
- Name the Layer as "Digitized_Road
- Set Geometry type as "Line"
- Set CRS EPSG:4167 – NZGD2000

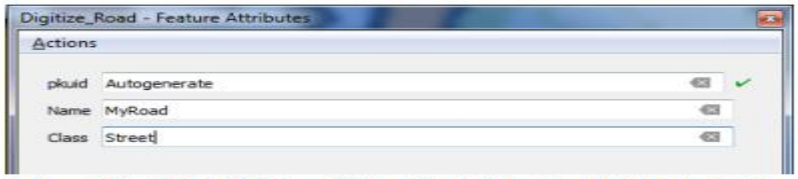


- Add "Name" and "Class" fields using "Add to Fields List".

- Once the layer is loaded, click the Toggle Editing button to put the layer in editing mode.

- Click the 

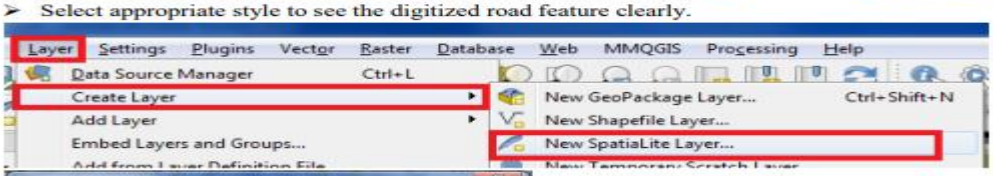
Add feature button. Click on the map canvas to add a new vertex. Add new vertices along the road feature. Once you have digitized a road segment, right-click to end the feature.

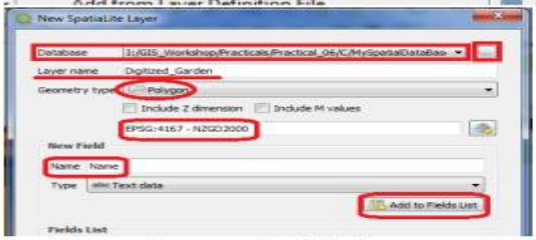


- On Layer Panel Right Click on Digitze_Road, Select the Style tab in the Layer Properties dialog.

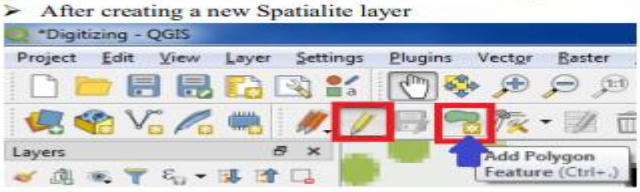

Result

- Select appropriate style to see the digitized road feature clearly.



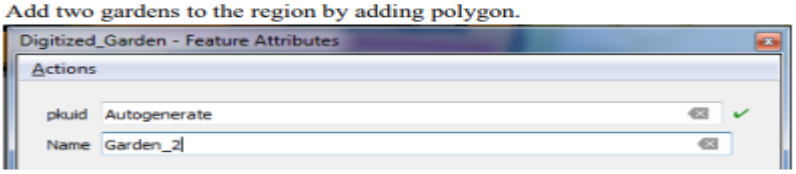


- After creating a new Spatialite layer

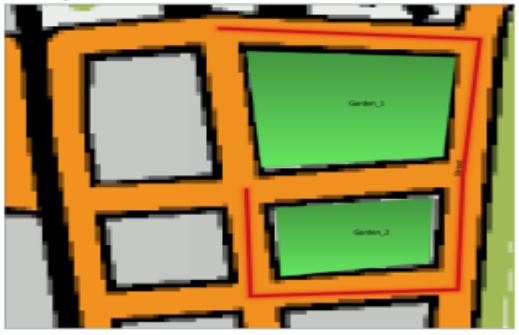


- Select Digitized_Garden layer in Layer Panel and click on Toggle Editing  button and then Add Polygon Feature  button on Tool bar.

- Add two gardens to the region by adding polygon.



- The Layer will appear on map canvas



- Using the above procedure a point feature can also be digitized.
- The digitizing task is now complete. You can play with the styling and labeling options in layer properties to create a nice looking map from the data you created.

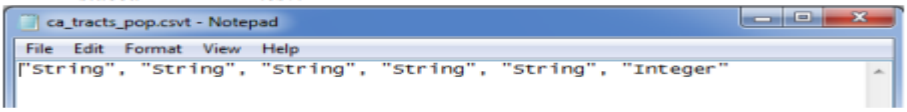
Prac 7

PRACTICAL - 7

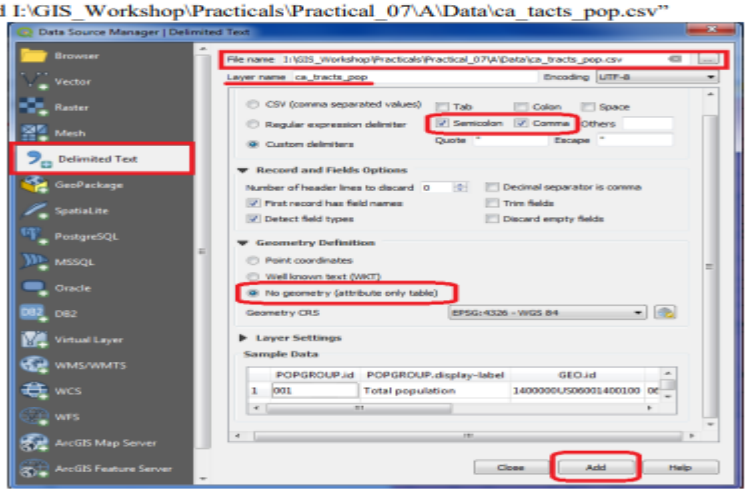
Managing Data Tables and Saptial data Sets:

a) Table joins

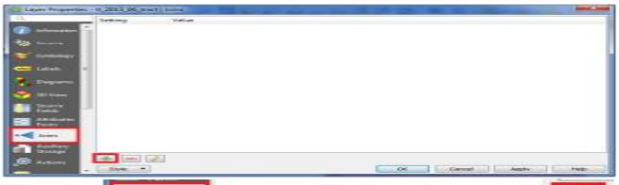
- Start a new project
- Go to Layer → Add Layer → Add new Vector Layer
  "I:\GIS_Workshop\Practicals\Practical_07\A\Data\tl_2013_06_tract.zip"
- We could import this csv file without any further action and it would be imported. But, the default type of each column would be a *String* (text). That is ok except for the *D001* field which contains numbers for the population. Having those imported as text would not allow us to run any mathematical operations on this column. To tell QGIS to import the field as a number, we need to create a *sidecar* file with a *.csvt* extension.



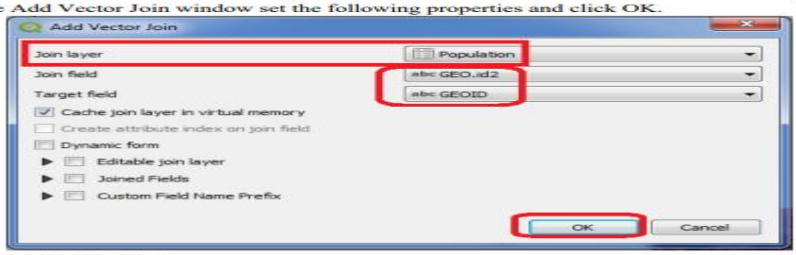
- This file will have only 1 row specifying data types for each column. Save this file as ca_tracts_pop.csvt in the same directory as the original *.csv* file.
- Go to Layer → Add Layer → Add Delimited Text Layer
  And add I:\GIS_Workshop\Practicals\Practical_07\A\Data\ca_tacts_pop.csv"



- In the layer panel, Right click on "tl_2013_06_tract", layer and select Properties

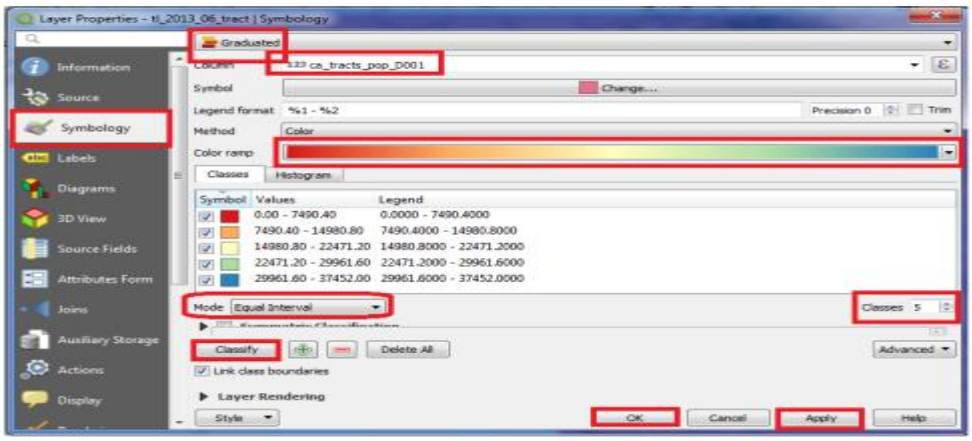


- Select the Joins option in Properties, and click on button to add new table join.
- In the Add Vector Join window set the following properties and click OK.

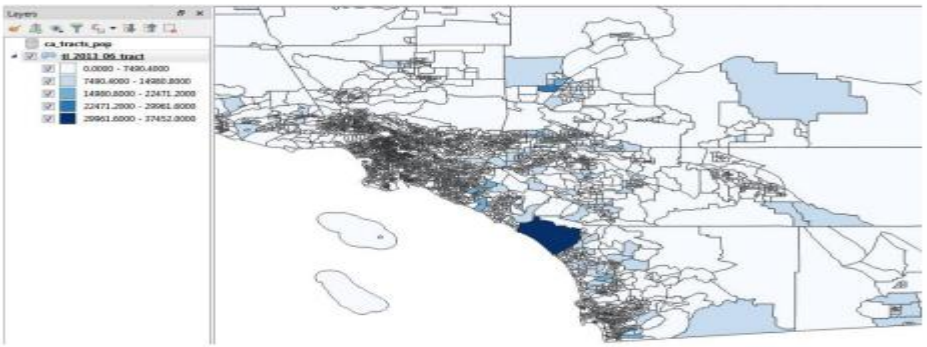


- After performing join

- For more clear output, select "tl_2013_06_tact" from Layer Panel, right click and select properties. Go to Symbology and set the following properties.



➢ A detailed and accurate population map of California can be seen as the result. Same technique can be used to create maps based on variety of census data.

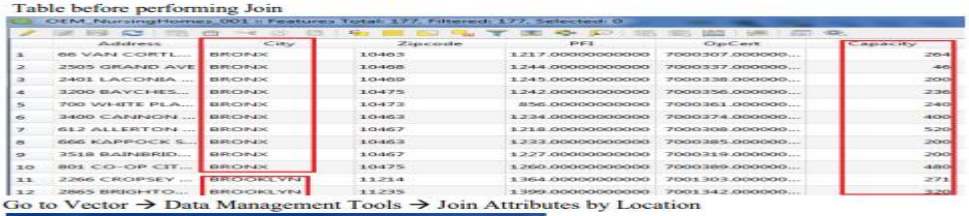


b) spatial joins

➢ Go to Layer → Add Layer → Add Vector Layer → Select "I:\GIS_Workshop\Practicals\Practical_07\B\Data\nybb_12c\nybb_13c_av\nybb.shp" and "I:\GIS_Workshop\Practicals\Practical_07\B\Data\OEM_NursingHomes_001\OEM_NursingHomes_001.shp", from data folder.

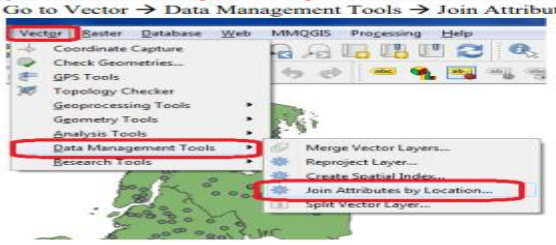
➢ Go to attribute table and observe the data.

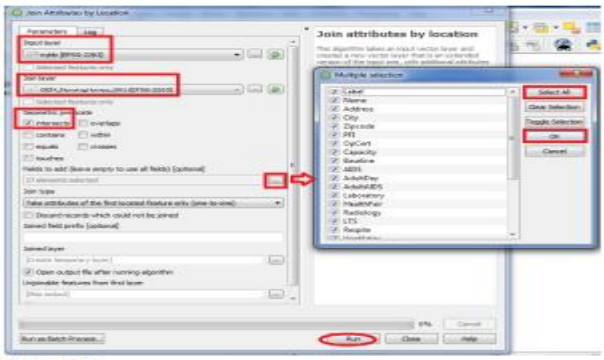
➢ Table before performing Join



	Address	City	Zipcode	PFI	OpCert	Capacity
1	66 VAN CORTL...	BRONX	10463	1217.00000000000	7000307.000000...	264
2	2505 GRAND AVE	BRONX	10468	1244.00000000000	7000337.000000...	46
3	2401 LACONIA ...	BRONX	10469	1245.00000000000	7000338.000000...	200
4	3200 BAYCHES...	BRONX	10475	1242.00000000000	7000356.000000...	236
5	700 WHITE PLA...	BRONX	10473	856.000000000000	7000361.000000...	240
6	3400 CANNON ...	BRONX	10463	1234.00000000000	7000374.000000...	400
7	612 ALLERTON ...	BRONX	10467	1218.00000000000	7000308.000000...	520
8	666 KAPPOCK S...	BRONX	10463	1233.00000000000	7000385.000000...	200
9	3518 RAINBRID...	BRONX	10467	1227.00000000000	7000319.000000...	200
10	801 CO-OP CIT...	BRONX	10475	1260.00000000000	7000389.000000...	480
11	2266 CROPSEY ...	BROOKLYN	11214	1364.00000000000	7001303.000000...	271
12	2665 BRIGHTO...	BROOKLYN	11235	1399.00000000000	7001342.000000...	320

➢ Go to Vector → Data Management Tools → Join Attributes by Location

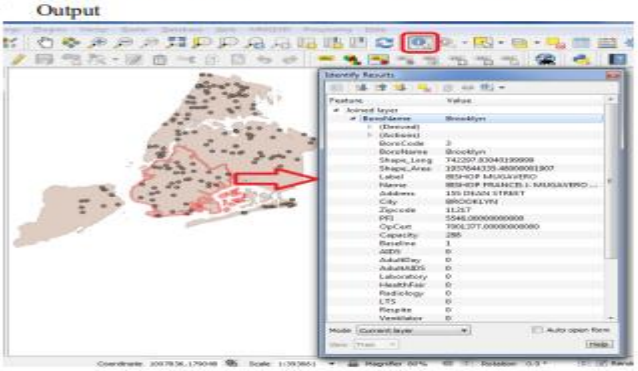




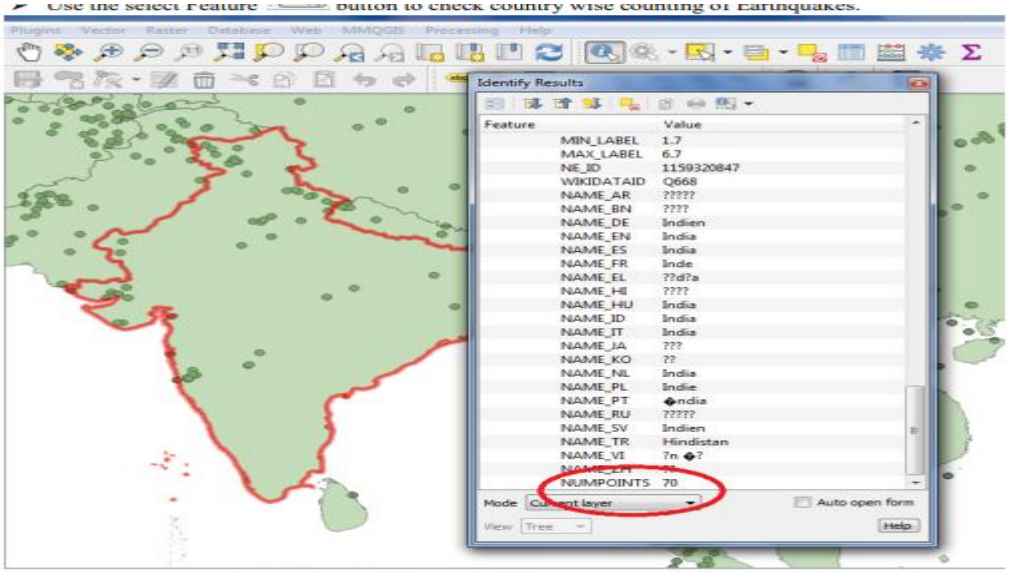
- Attribute table after join

City	Zipcode	PFI	OpCert	Capacity
ASTORIA	11102	6384.000000000000	7003405.000000...	280
BROOKLYN	11217	5546.000000000000	7001377.000000...	288
BRONX	10472	1251.000000000000	7000381.000000...	200
STATEN ISLAND	10304	1755.000000000000	7004310.000000...	300
NEW YORK	10003	4807.000000000000	7002351.000000...	28

- Use the Identify Feature  Button to select a region to view join data on map Layer.
- Output



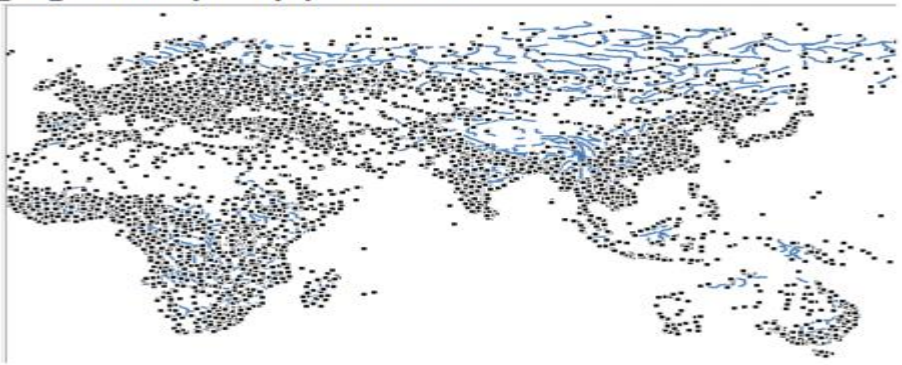
- Use the select Feature [illegible] button to check country wise counting of Earthquakes.



- Also a new column is added to attribute table "NumPoints" indicating number of earth quake points in each country.

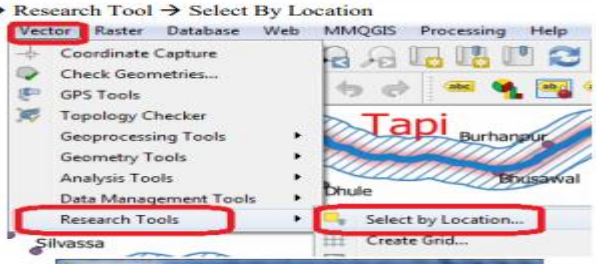
d) Performing spatial queries

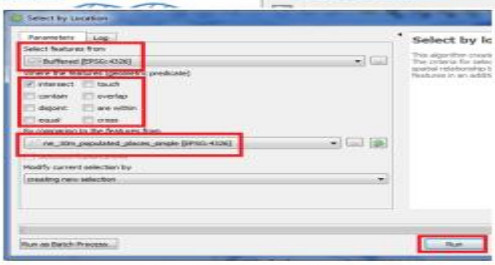
- Go to Layer → Add Layer → Add Vector Layer and load "\GIS_Workshop\Practicals\Practical_07\D\Data\ne_10m_populated_places_simple\ne_10m_populated_places_simple.shp" and "I:\GIS_Workshop\Practicals\Practical_07\D\Data\ne_10m_rivers_lake_centerlines\ne_10m_rivers_lake_centerlines.shp" from project data folder.



- Open project Properties → Set CRS "World_Azimuthal_Equidistant EPSG 54032" . The map will be re-projected as

- Go to Vector → Research Tool → Select By Location





- This will highlight only those rivers containing a populated place within 2 KM