

GIS/RS APPLICATION TO CIVIL ENGINEERING (Lab)



MINI PROJECT

Submitted By: Asim Siddiq

Reg.no: 7691

Submitted To: Engr. Hamza Mustafa

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Section: A

Department: Civil Engineering

Contents

ABSTRACT:.....	4
Introduction:.....	4
Getting Street Map for Peshawar	4
Extracting point data of all relevant facilities:	7
Making Buffer (Distance Radius) for all facilities:	9
Making UNIONS of Buffer Layers:	10
Intersecting Unions to	11
Conclusion	12

TO SELECT BEST RESIDENTIAL LOCATION IN PESHAWAR

ABSTRACT:

QGIS is a best tool for Geological information and to make decisions related to any desired problem related to either best location or best route. We use the software to solve a similar problem. QGIS was used to select a residential location for home that was located near to all essential facilities like Mosque, Shops, Café, Restaurants, Hospitals, Markets, Clinics etc... First we download street map for Peshawar that include all Geological information about the city then we extract only relevant points relevant to my desire, then using Geo-processing tools we choose the Possible Location for Home that is in 5km range of Hospitals and Restaurants, 100m range of Shops and Mosques, 3km in range of Universities, Schools, Colleges, Banks, ATMS and Market and Malls.

Introduction:

QGIS functions as geographic information system (GIS) software, allowing users to analyse and edit spatial information, in addition to composing and exporting graphical maps. QGIS supports both raster and vector layers; vector data is stored as either point, line, or polygon features. Multiple formats of raster images are supported, and the software can Geo-reference images.

In the given discussion we were asked to find a best possible location to Build or Buy a Home that must be in possible and optimum range of all facilities like Mosque, Shops, Café, Restaurants, Hospitals, Markets, Clinics etc... So we choose the QGIS to perform Solution to the problem. The Distance range of Different facilities are 5km range of Hospitals and Restaurants, 100m range of Shops and Mosques, 3km in range of Universities, Schools, Colleges, Banks, ATMS and Market and Malls. The procedure for doing so is described in the topics below.

Getting Street Map for Peshawar

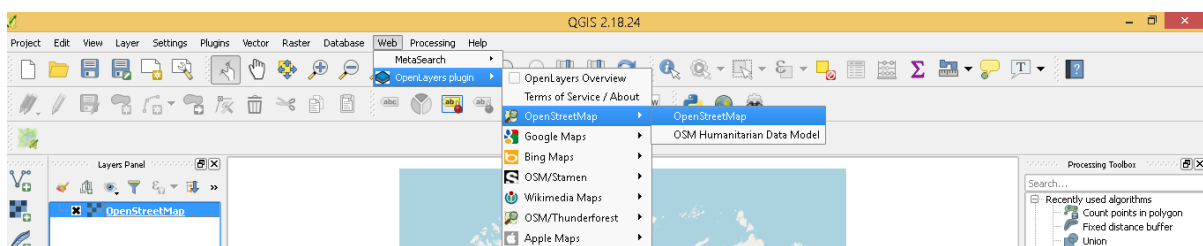
Open the software and go to

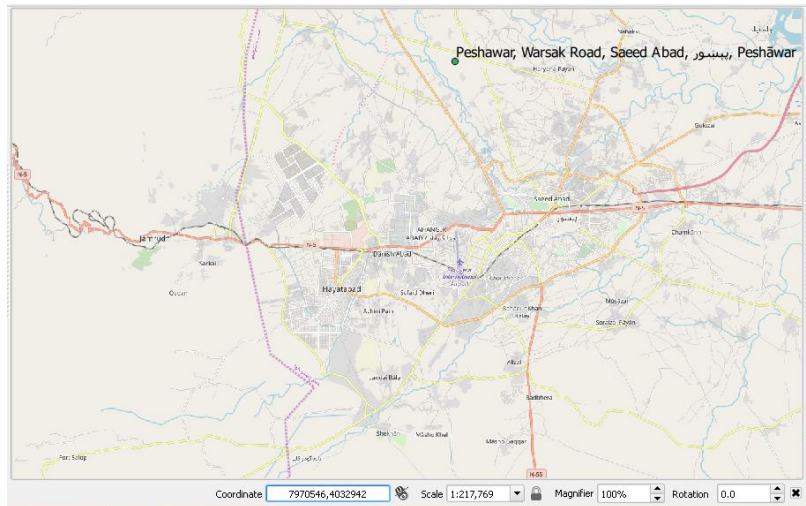
1. Main Menu → WEB → Open Layer Plugins → Open Street Map → Open Street Map.

Then using Geo-Coding tool, we Search for Peshawar.

2. Main Menu → Plugins → Geocoding → Geocoding.

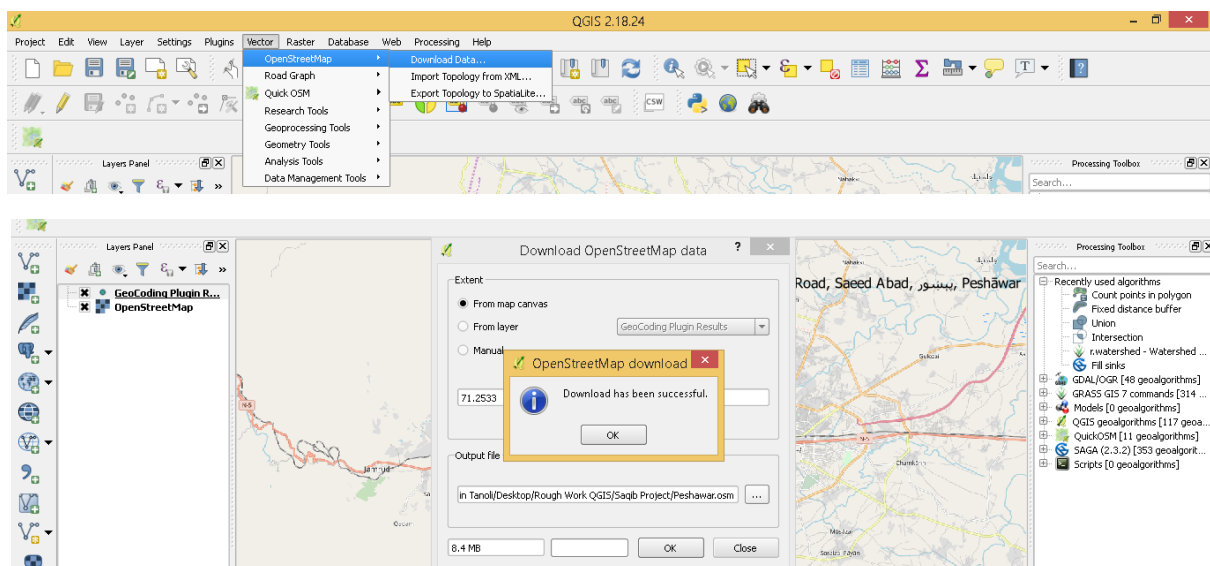
The steps are shown below





Download the map in Canvass

3. Main Menu → Vector → Open Street Map → Download Data.



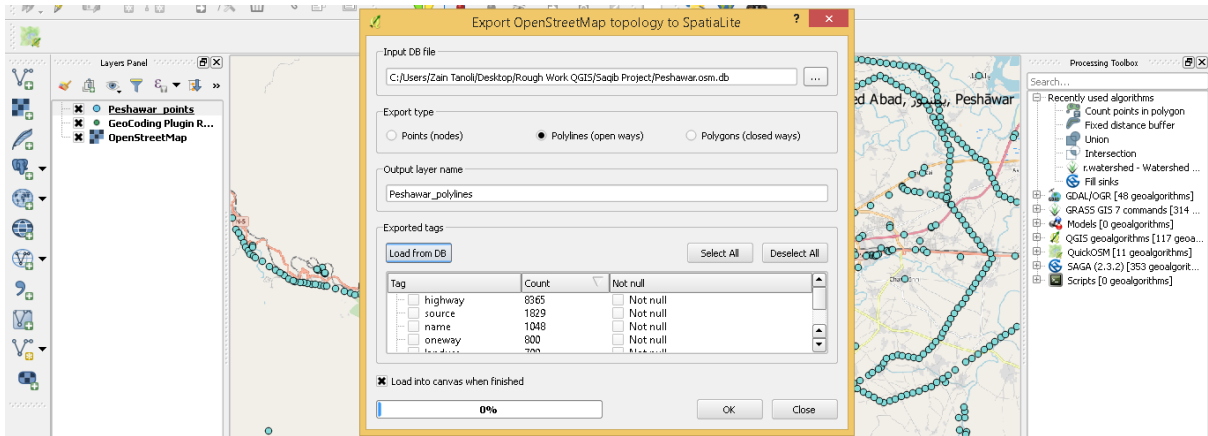
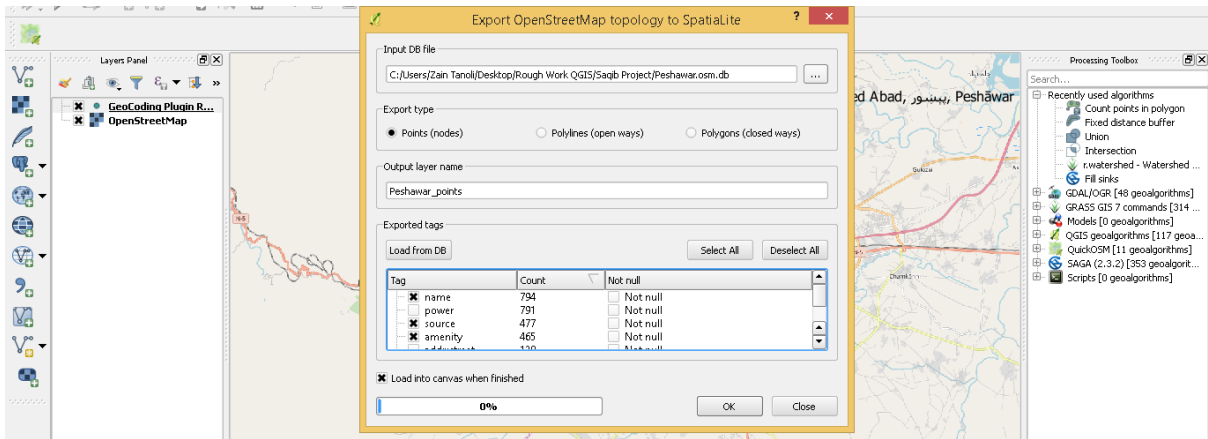
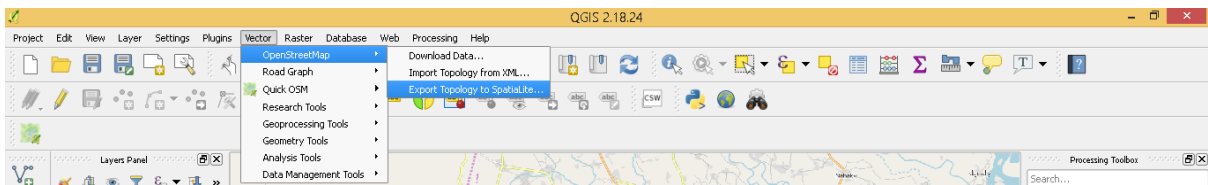
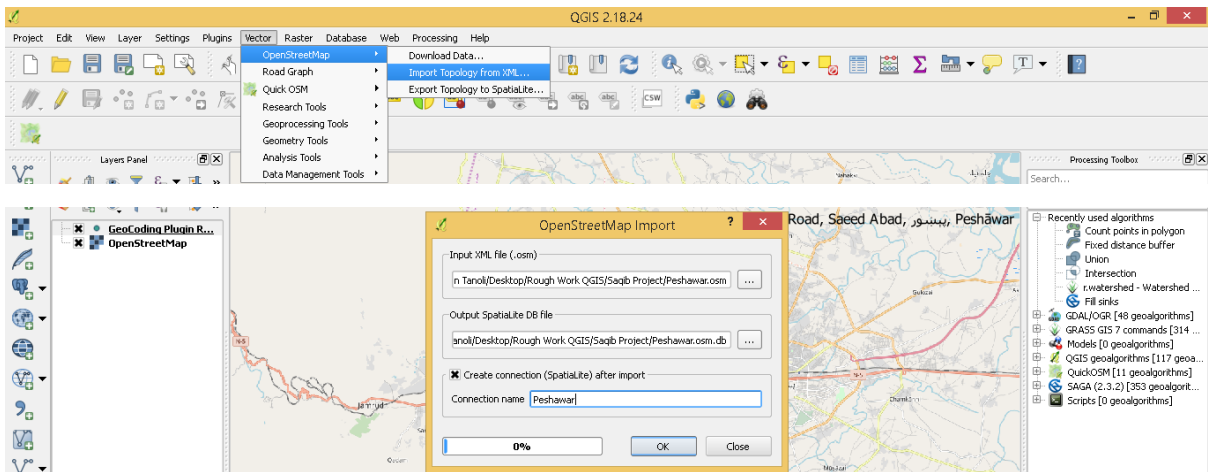
Convert The (.osm) file into database file (.db)

Then Extract the point data from database file also get the polyline data.

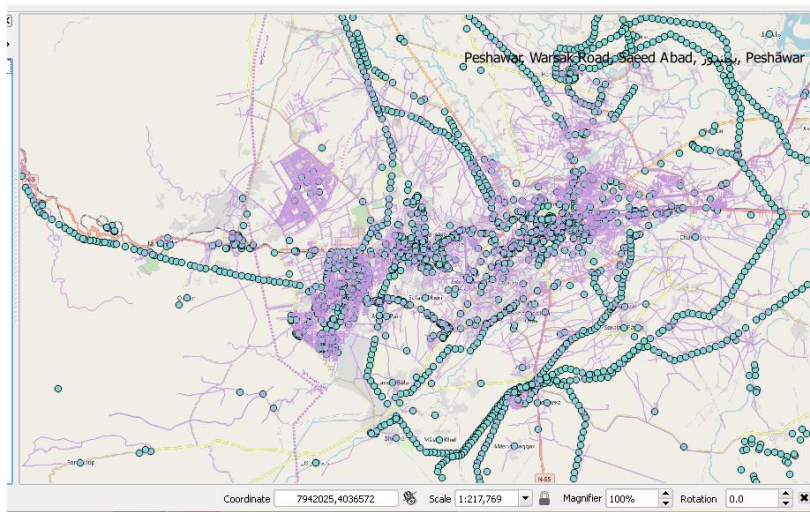
4. Main Menu → Vector → Open Street Map → Import Topology from XML.

5. Main Menu → Vector → Open Street Map → Export Topology to Spatialite.

The steps are shown below



The Map we extracted is given below



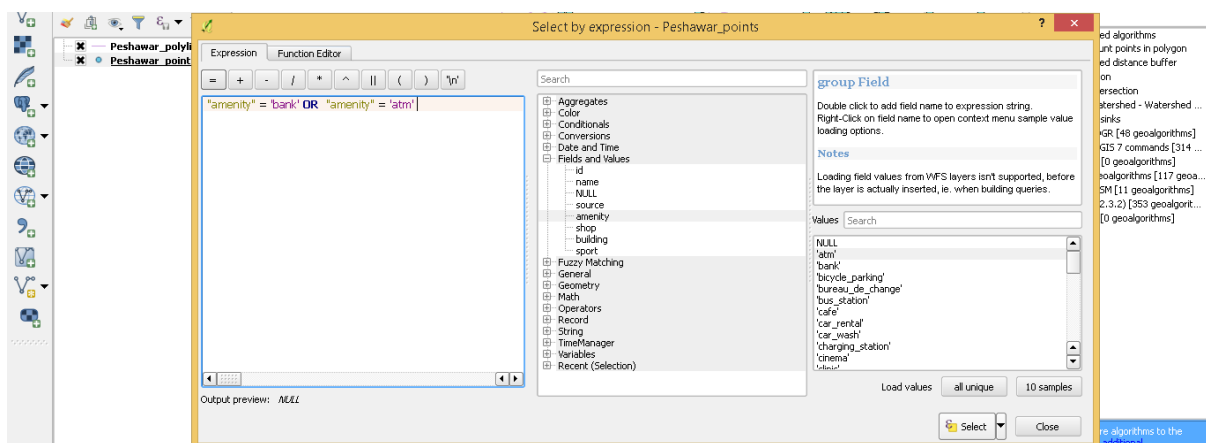
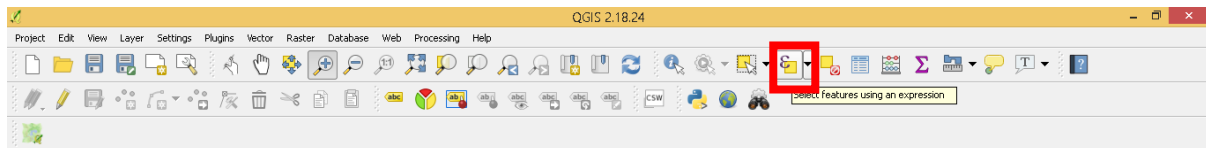
Extracting point data of all relevant facilities:

Using Selection Feature using an expression, Select the all facilities that are required for the problem.

Then in Field and Values Tab Select the desired facilities using expression.

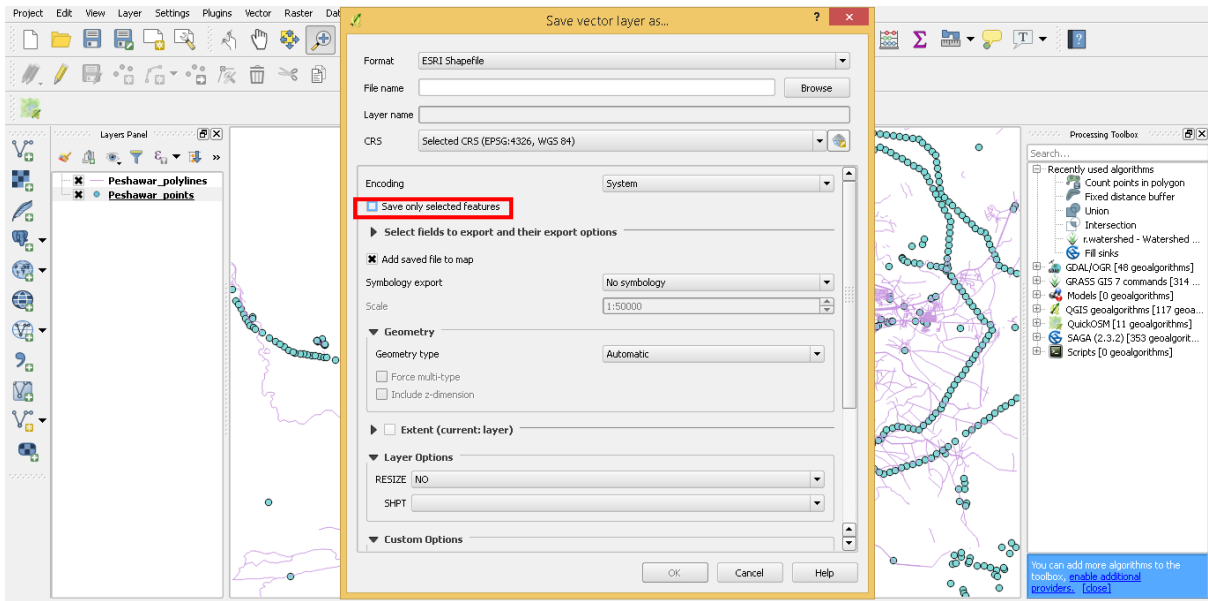
After selecting each facility, I save the Point data files.

The steps are shown below.

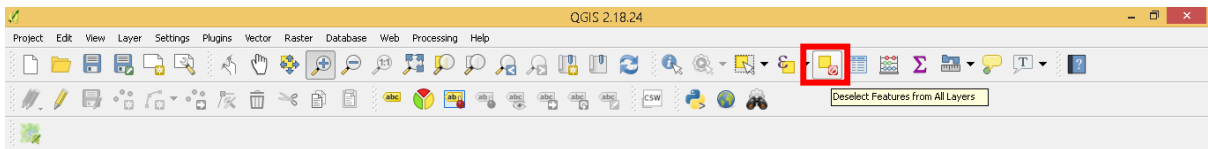


Click on “Amenity” and click on “All Unique” to see all facilities

Then right Click on Point Layer and Click on “Save as”.

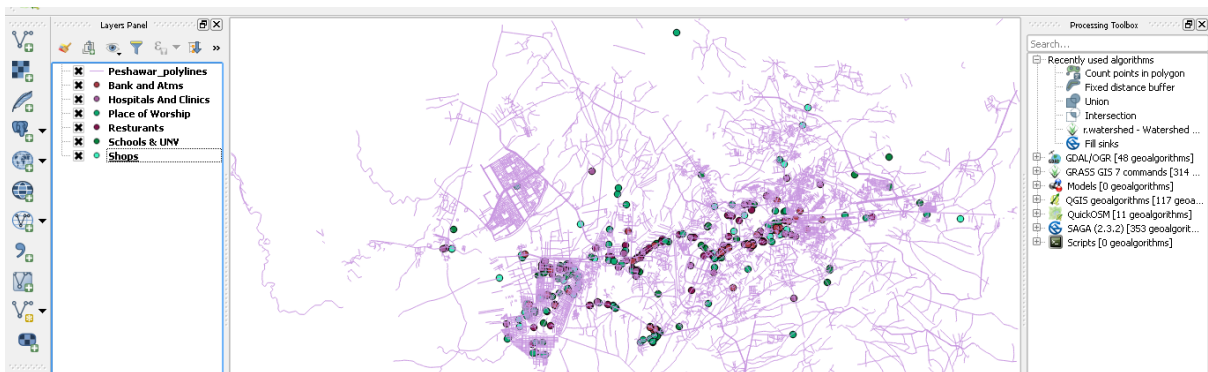


Then after Saving one-point file Deselect the parent File as following



Then Repeat the same process for all facilities Point files.

Finally, I get different Point Layers.



Making Buffer (Distance Radius) for all facilities:

Using Geo-processing tool, I created a Circle around every facility of my required Radius.

This is done in accordance with my desired distance from a particular facility.

For this I used Fixed Buffer Distance and Select Every Point data and give input Radius,

The radius in the software is taken as 1=100km, So I scaled my radius according to Scale and Input it in Dialog BOX.

The Facilities along with their radius are Scales as

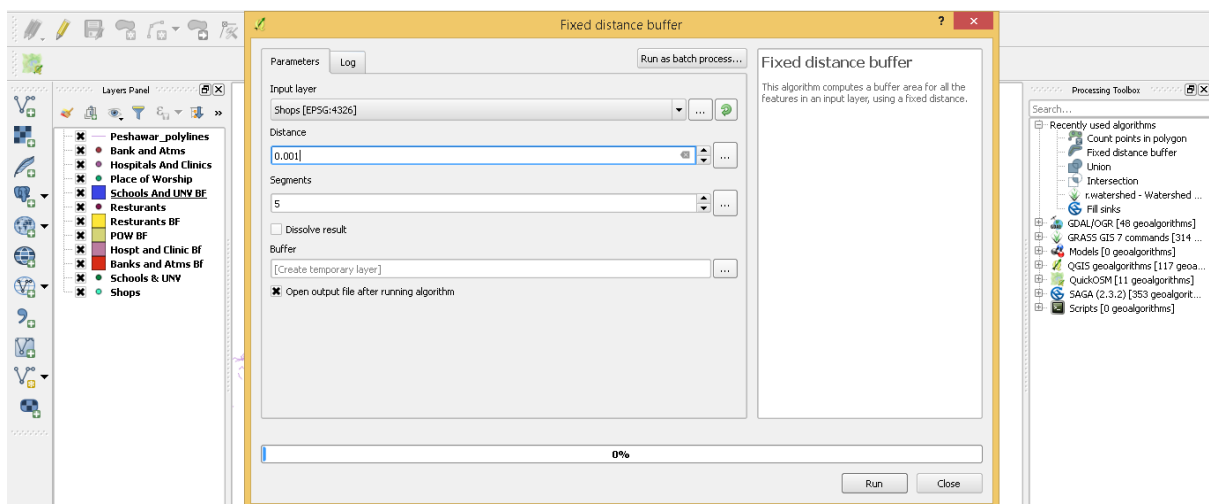
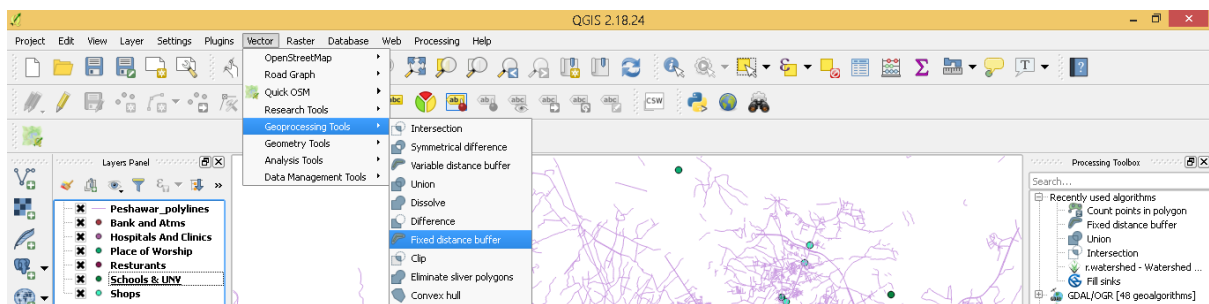
“0.05” for 5km range of Hospitals and Restaurants

“0.001” for 100m range of Shops and Mosques

“0.03” for 3km in range of Universities, Schools, Colleges, Banks, ATMS and Market and Malls.

The Steps described above are shown below

Main Menu→Vector→Geo-Processing tools→ Fixed Buffer Distance.



Making UNIONS of Buffer Layers:

Then after making buffers for every point data layer, I used the union command to make combinations of two buffer layer.

I make the combinations as

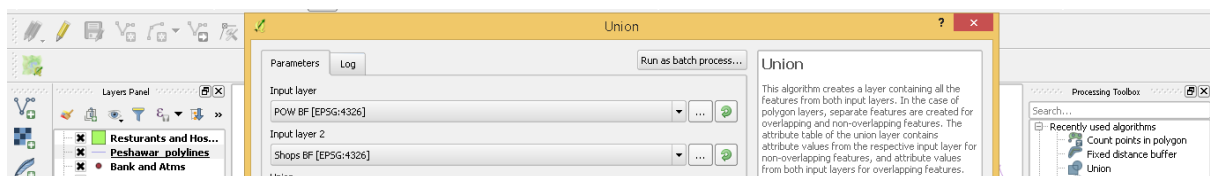
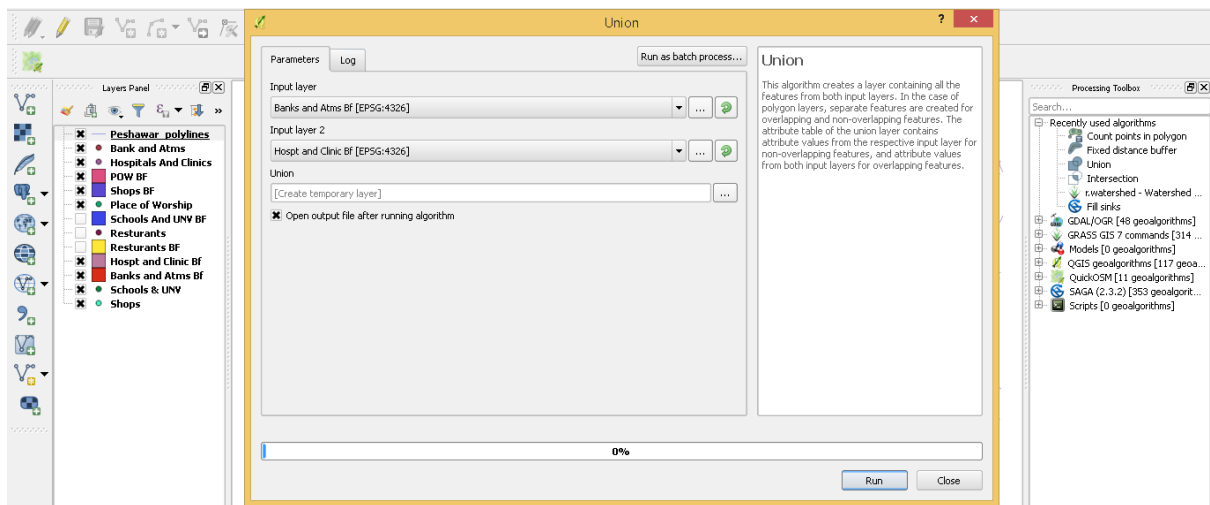
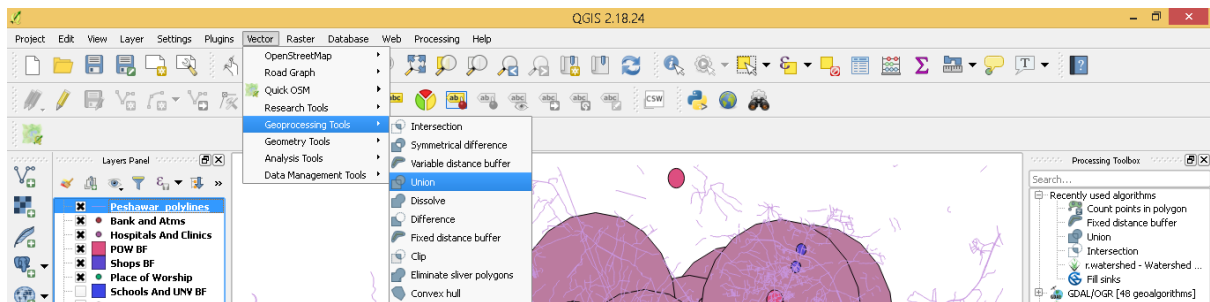
Banks and Hospital

Mosques and Shops

Universities and Restaurants.

The steps are shown below

Main Menu → Vector → Geo-Processing tools → Union.





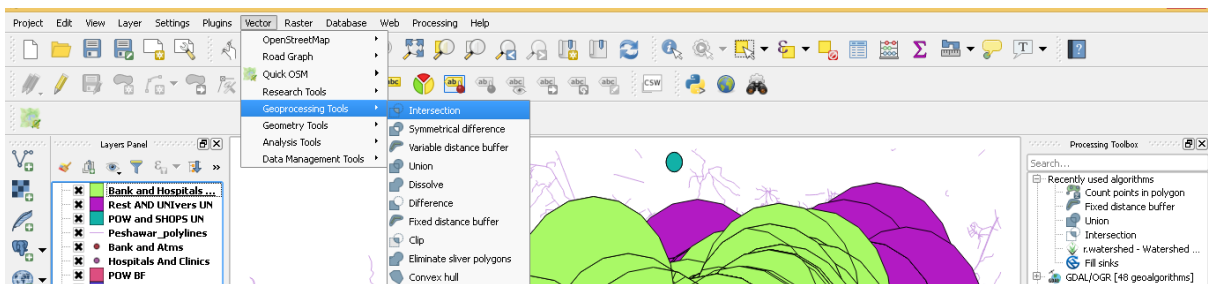
Intersecting Unions to

Using intersection command to get Possible Locations that meet all the Requirements.

After making Unions among two-two facilities ,1st make Intersection among two unions then the intersected layer is intersected with the other union.

The intersection is done as

Main Menu → Vector → Geo-Processing tools → Intersection.



Finally, we get possible Location for the Home that are 5km range of Hospitals and Restaurants, 100m range of Shops and Mosques, 3km in range of Universities, Schools, Colleges, Banks, ATMS and Market and Malls.

Conclusion

We get all the location meeting the requirements now we have to decide among these locations either on the basis of Land Cost or either the more the location is near to main road or street the priority is ours..

The map for the locations is shown below

