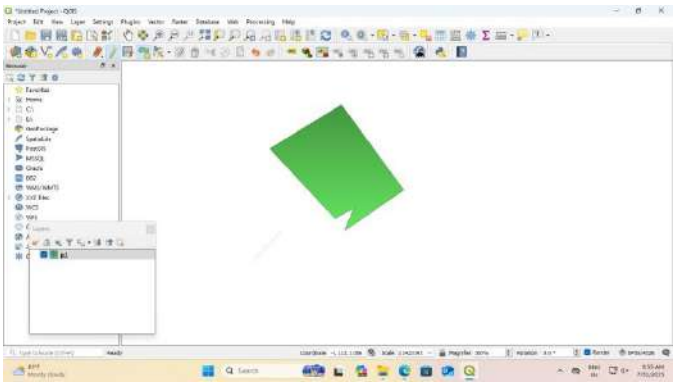
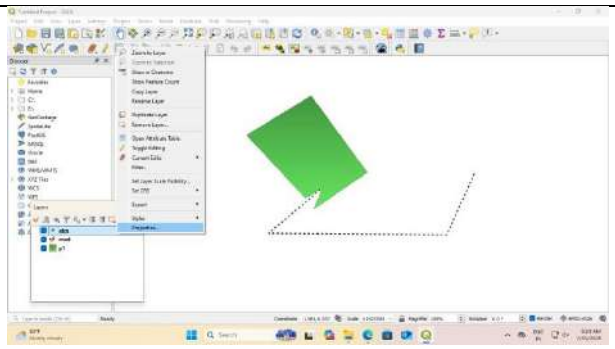
K.E.T's V.G. Vaze College (Autonomous), Mulund (E)

Roll no: A062 Name: Sushant More

Practical 1

	Familiarizing Quantum GIS: Installation of QGIS, datasets for both Vector And Raster data, Maps.
Practical 1	Creating and Managing Vector Data: Adding vector layers, setting properties, formatting
Question(a)	a . Creating and Managing Vector Data: Adding vector layers
steps	Select Project → New Select Layer → Create Layer → New Shapefile Layer Select Polygon option from Geometry type >Create a file name >give a name >Select type as text >select length as 80 >Click on Add to Field List Button. >You can add as many fields (Column Name) as you want for the layer. a) Follow the steps to plot Polygon features. >Select the Polygon Feature from layer panel Click Toggle Editing Button → Click on Add Polygon →Now place the cursor at the location where you want to place the polygon Save the newly added polygon as follows.  >Set style for polygon by using property window (Right click on garden Layer) Following screen will appear on the screen. Select pattern as you want and click on OK.



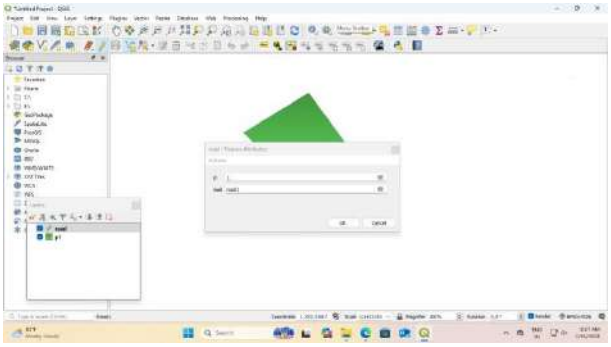
b) Creating Line vector layer

> Repeat the same steps as we have done for polygon layer. >Select geometry type Line.

Road layer:

>To plot road click on Add Line Feature. >Click on the map where you want to draw line.

> Once you are done then right click on map (Dotted line turn into solid line) and save id and road



> set style for Roads in the same way as we have done for polygon

> To label your roads Right click on Road layer Go to properties window then select label and set single label property

To merge roads

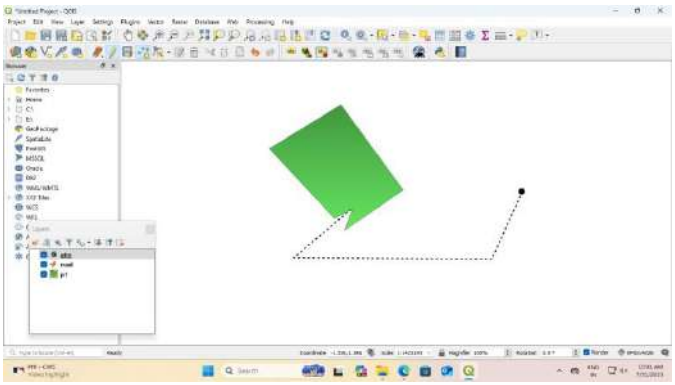
> Go to properties of road then select symbology. Click on Advanced button select symbol levels

>Check Enable symbol levels option

C) Create Point vector layer

>Repeat same steps to add point layers as we have done in previous layers. Final output after adding atm

Map



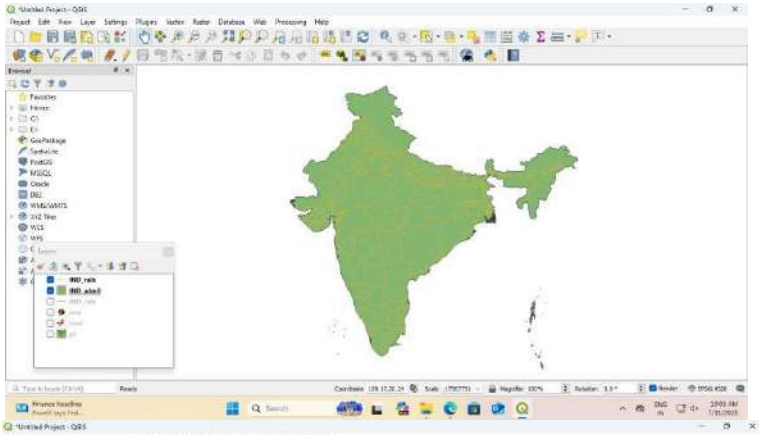
d) Calculating line lengths and statistics

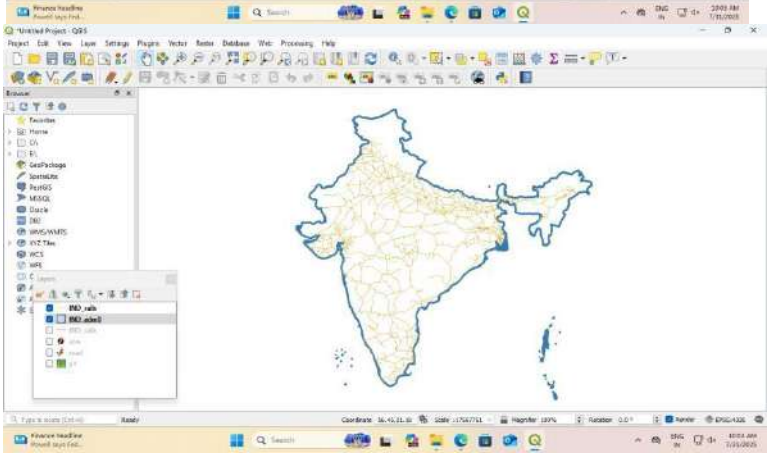
Add the following file to project

"Practical_01\D\DATA\IND_rrd\IND_rails.shp" Press “ADD”

>AlsoaddIndia Administrative

“Practical_01\D\DATA\IND_adm\IND_adm0.shp”





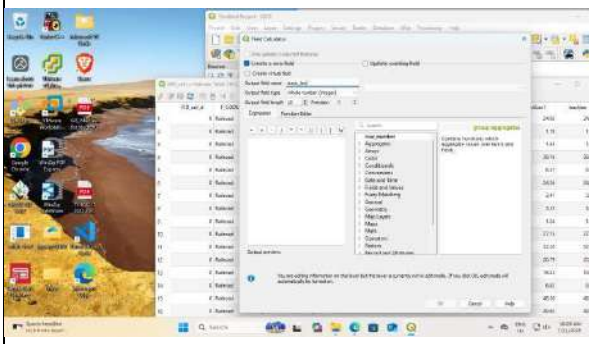
>Double Click on IND_adm0 >select symbology>select any outline

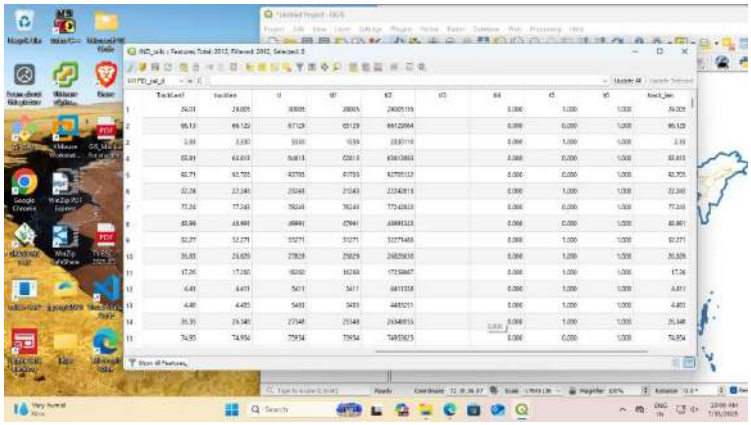
Press OK > The display window will appear like

>in layer panel right click on IND_rails >open attribute table

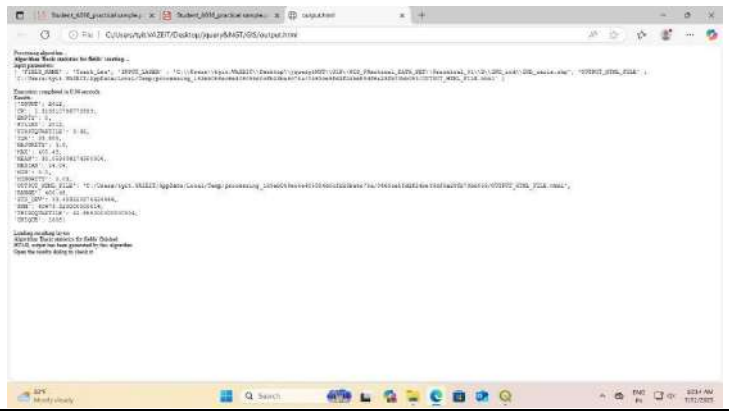
>Press Toggle Editing button using button, on Attribute table window toolbar. P

Open Field Calculator using button.>Set the output field as “Track_Len”, field typ

	“Decimal Number”.>From Function List search $length or go to Geometry → Se $length  Press “OK” > A new column is added to the attribute table with value representing the length of track in KM. > Press CTRL+S or click on Save Edits option on tool bar > Close the attribute table window. > For calculating the total length of Railway tracks in India. > Select Vector→ Analysis Tools→ Basic Statics for Fields. >Select IND rails layer from input layer. And select Track Len in “Field to Calculate statistics on”



>press run >the result is



>Open the “output.html” file to get the field statistics.

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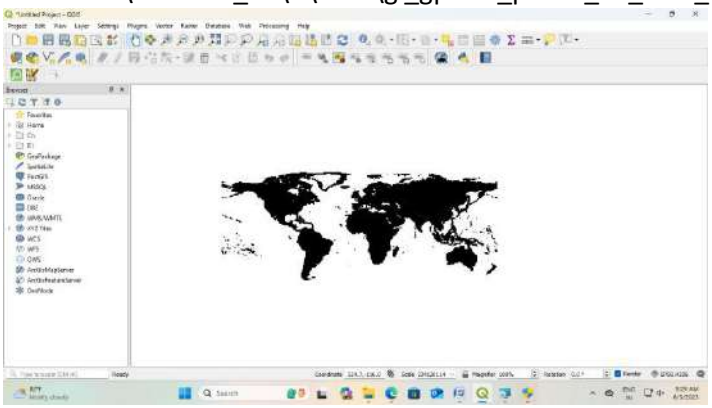
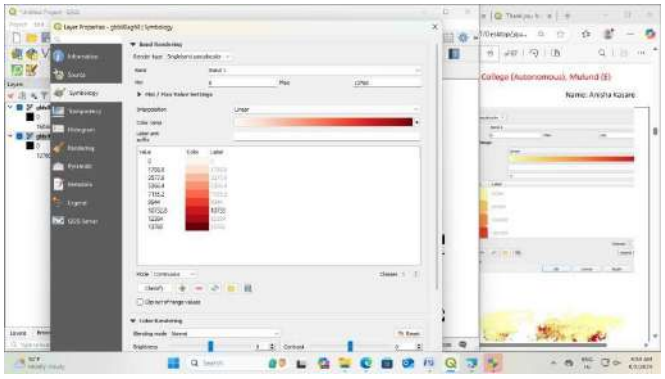
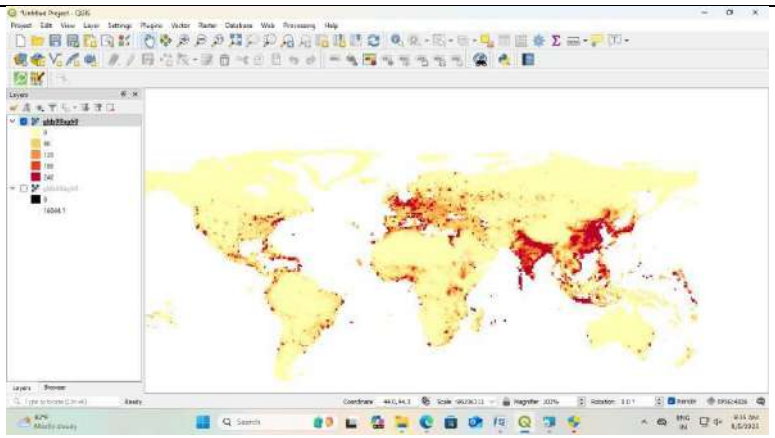
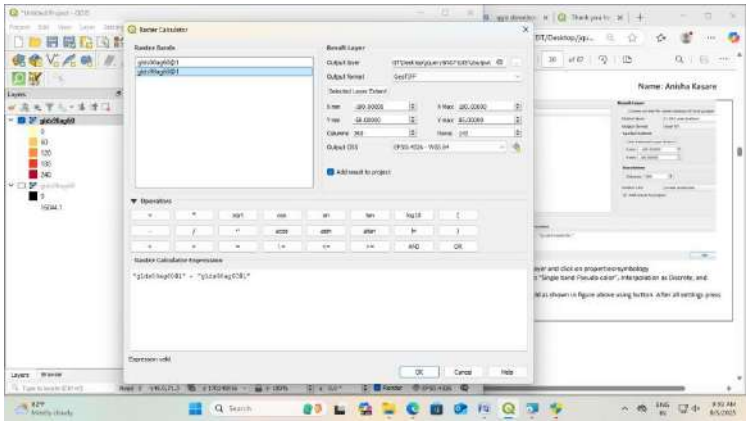
Practical 2

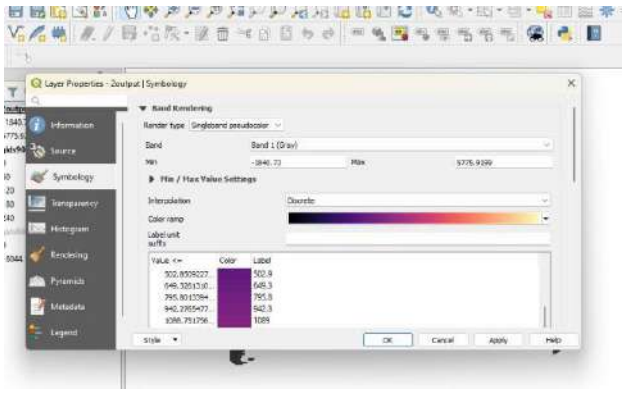
Practical 2	Exploring and Managing Raster data: Adding raster layers, raster styling and analysis, raster mosaicking and clipping
question	a) Adding raster layers
	>From menu bar select Layer → Add Layer → Add Raster Layer > Select Gridded Population of the World (GPW) v3 dataset from Columbia University, "Practicals\Practical_02\A\Data\gl_gpwv3_pdens_90_ascii_one\glds 90ag60.asc" "Practicals\Practical_02\A\Data\gl_gpwv3_pdens_90_ascii_one\glds00ag60.as c"  b) Raster Styling and Analysis >To start with analysis of population data, convert the pixel from grayscale to Color. >Select "glds90ag60.asc" Layer form layer Pane → select property OR double click on it. >select symbology > select singleband pseudocolor >Change values and press apply  This is output



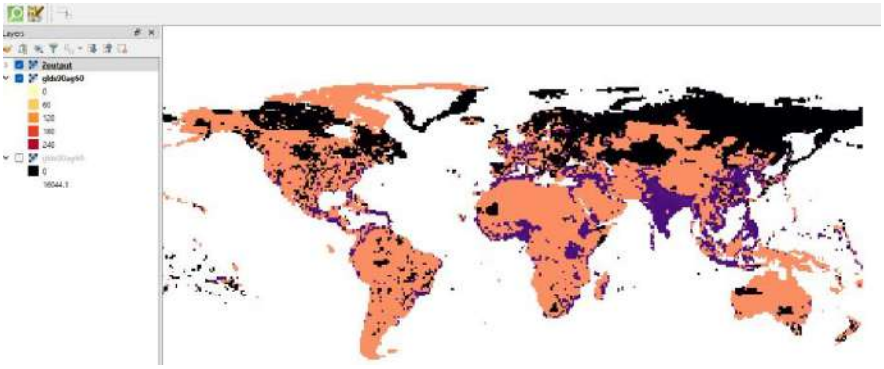
Go to Raster → Raster Calculator >Put the expression "glds00ag60@1" - "glds90ag60@1" >Select the output file location & name and Press OK.



>right click on out layer and click on properties>symbology >Set Render Type to “Single band Pseudo color”, Interpolation as Discrete, and remove all classification and add as shown in figure above using button. After all settings press “OK”.

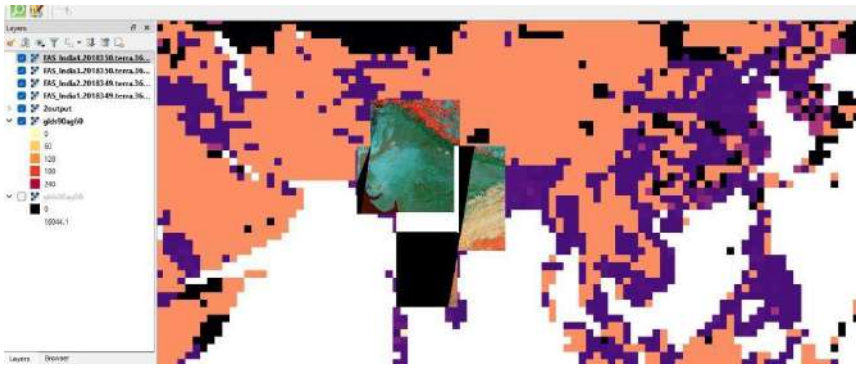


> Layer will appear like this



c) Raster Mosaicking and Clipping

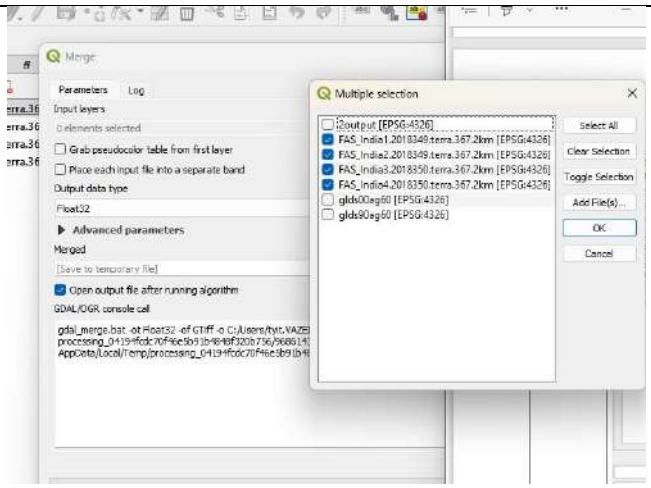
Go to Layer → Add Layer → Add Raster Layer. Select the following ".tif" raster images for India from data folder. FAS_India1.2018349.terra.367.2km.tif FAS_India2.2018349.terra.367.2km.tif FAS_India3.2018349.terra.367.2km.tif



FAS_India4.2018349.terra.367.2km.tif The output will look like this

Click on raster>select miscellaneous>merge

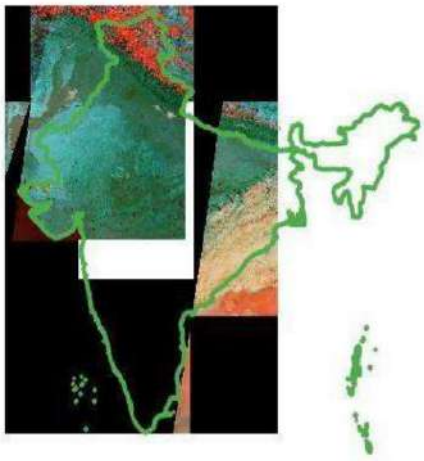
> In the Merge dialog window > Select all layers and Press OK. > In Merge dialog window select a file name and location to save merged images.

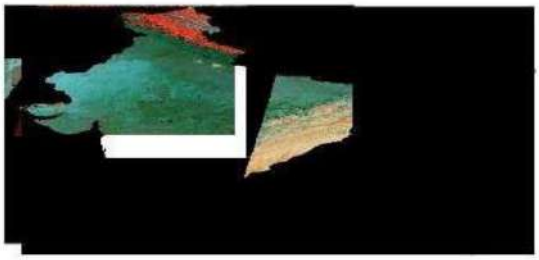


Click on run Output will be like this

You can now deselect individual layers from layer pane and only keep the merged raster file. >Go to Layer→ Add Vector Layer → Select Practicals\Practical_02\C\IndiaAdminBoundry\IND_adm0.shp file. From layer properties → select symbology→ select any one of the following border

>The result will be



	Go to Raster → Extraction → Clip Raster by Mask Layer > Select the merge raster image as input and Ind_adm0 as mask layer. > Select a file name and location for clipped raster as clipped >Press run 

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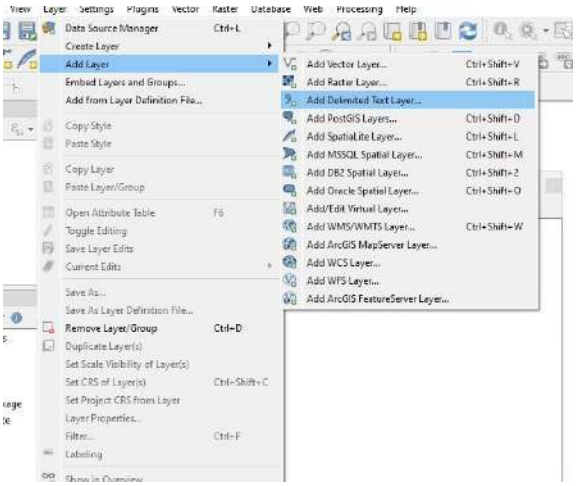
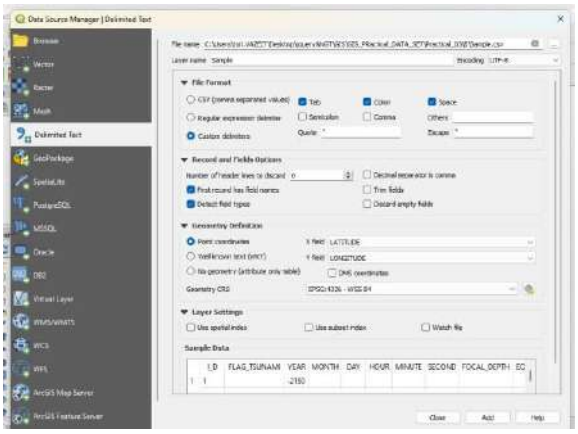
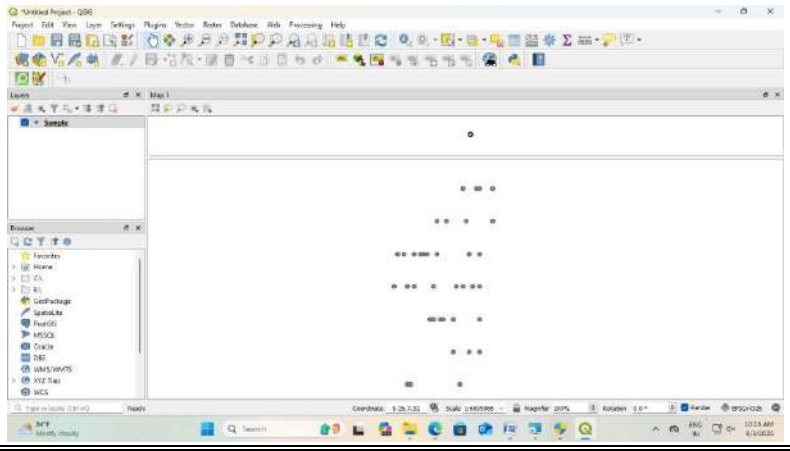
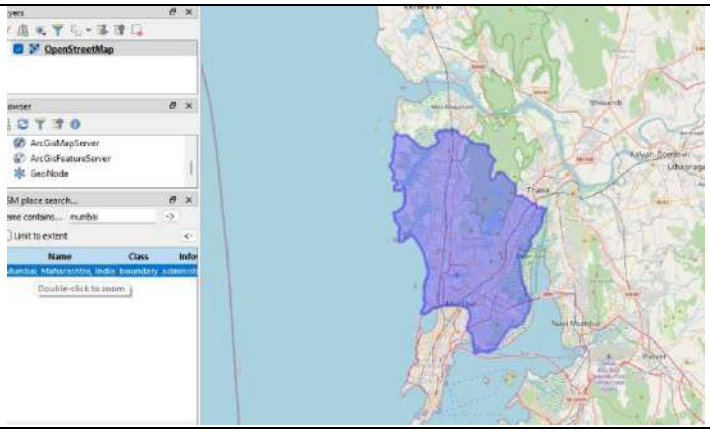
Practical 3

Practical 3	
Question	Making a map, Working with attributes, Importing spreadsheets or CSV files, Using plugins, Searching and downloading OpenStreetMap data
Steps	A)Making a Map >Create a new Thematic Map or open and existing one B)Importing Spreadsheets or CSV file >Many times the GIS data comes in a table or an Excel spreadsheet or a list lat/long coordinates, therefore it has to be imported in a GIS project. >Sample file for Earthquake data will be used in this practical. > Go to Layer → Add Layer → Add Delimited text Layer 

	>Data Source Manager | Delimited Text window will appear >Select the  Practicals\Practical_03\C\Sample.csv file from data folder. Press ADD and close the window.
	

	C)Using Plugins • Core plugins are already part of the standard QGIS installation. To use these, just enable them. • Open QGIS. Click on Plugins → Manage and Install Plugins.... • Add “Open Layer” and “OSM Search” Plugin from Not Installed option from Plugin Manager Dialog Box. > The OSM Place Search plugin will install itself as a Panel in QGIS, if not go to View → Panels → select OSM Place Search. Go to Web → Open Layer Plugin and select Open Street Map In Osm search panel>enter mumbai
output	

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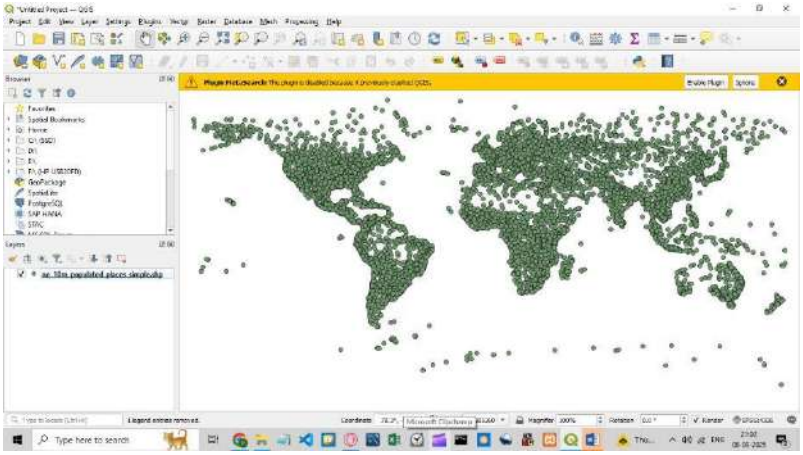
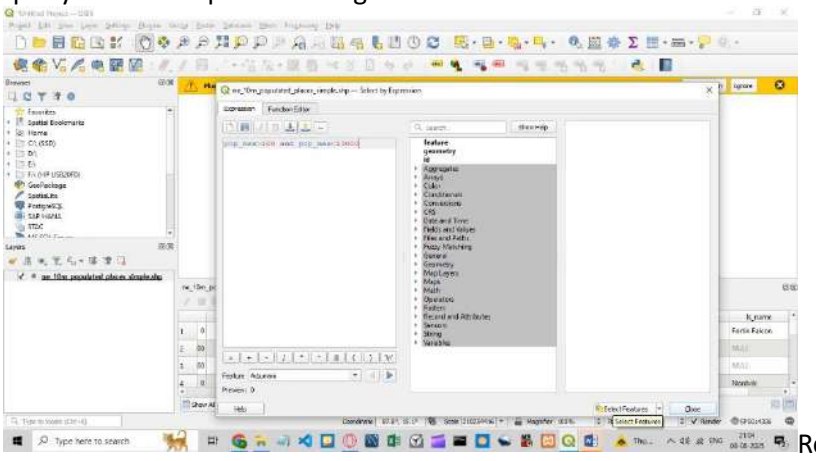
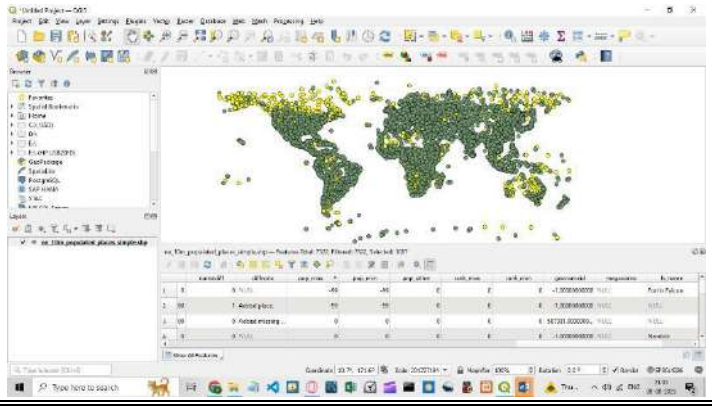
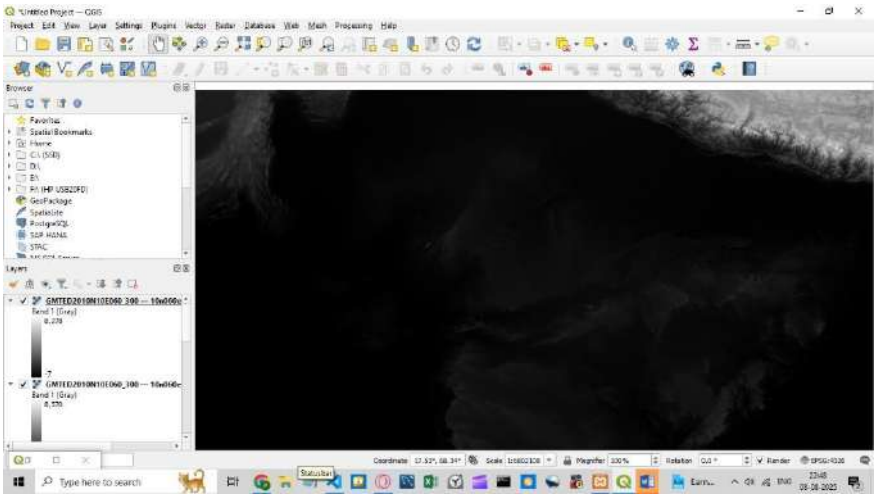
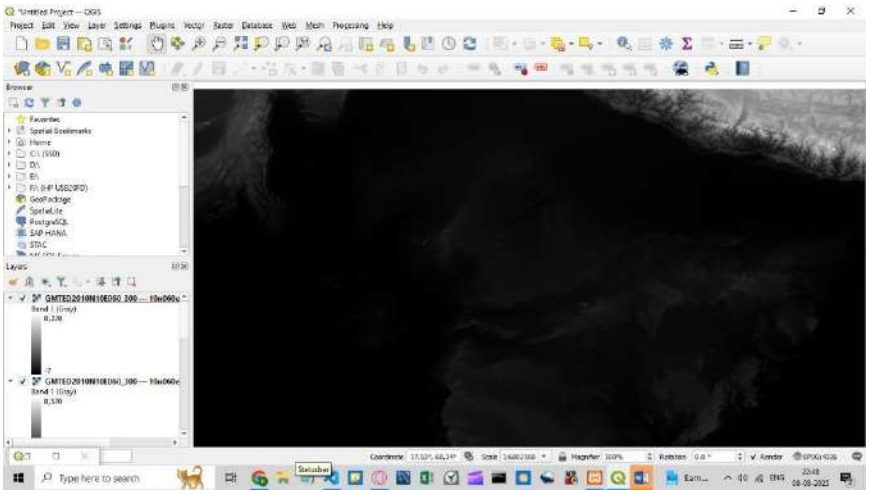
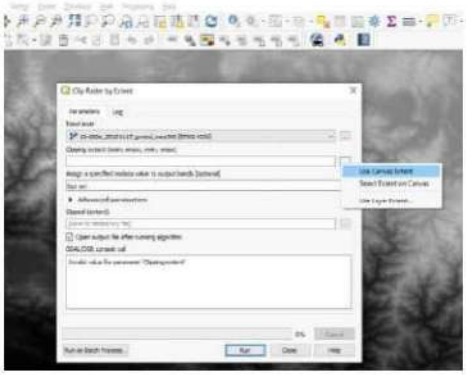
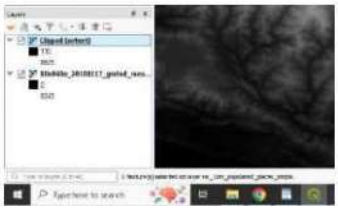
Practical 4

Practical 4 (a)	Working with attributes.
Question	Working with attributes
Steps	Add Vector Layer and give path as shown.  Right Click and go to Open Attributes table-> Select by Expression Write query to select a particular region as shown below.  Region selected.

Output	
Practical 4 (b)	
Question	Working with terrain Data
Steps	Add Raster Layer-> Give path as shown below Click Add 

	 Change the coordinates and scale as shown Go to Raster-> Extraction-> Clip raster by extent. A dialogue box appears.

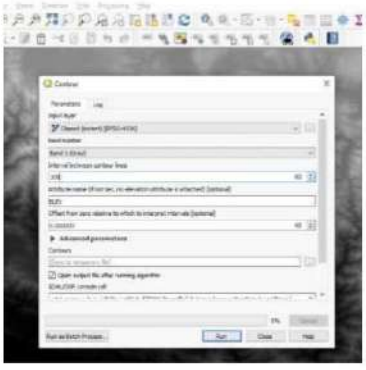


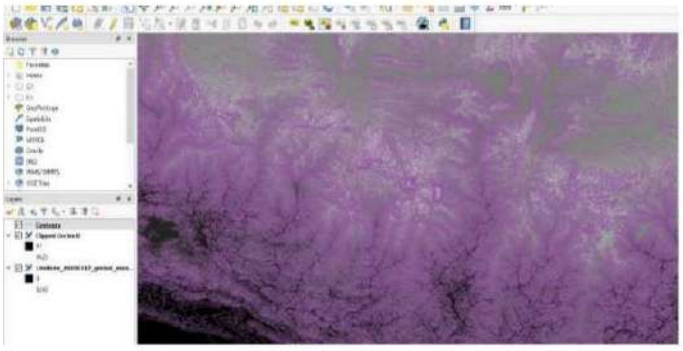


☐ 1.Go to raster->Extraction-> Contour. A dialogue box appear

☐ 1.Go to raster->Extraction-> Contour. A dialogue box appear

Go to raster->Extraction-> Contour. A dialogue box appear



output	

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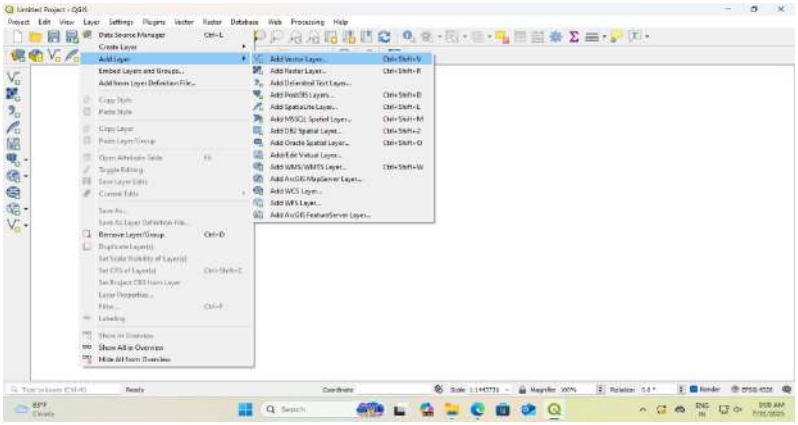
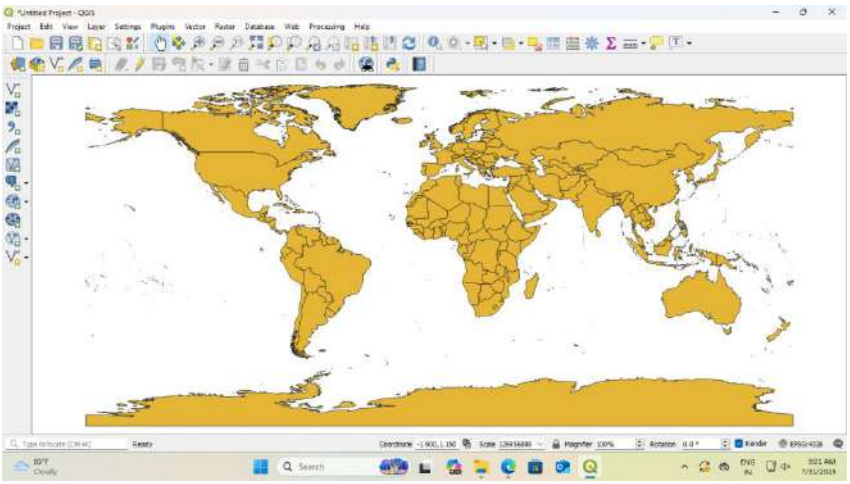
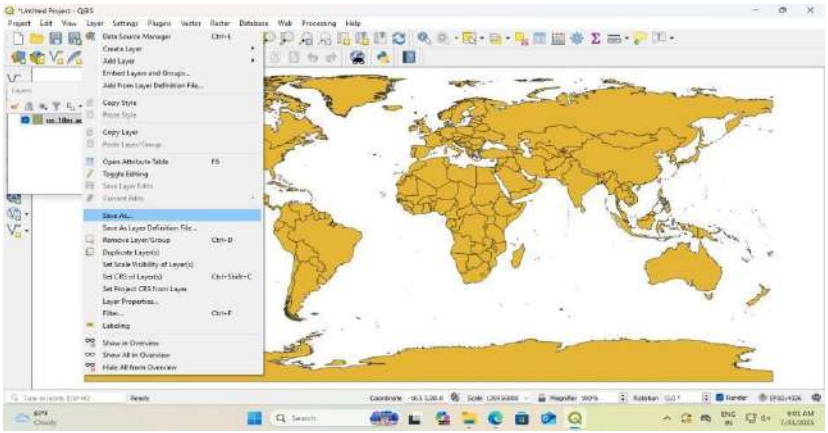
Practical 5

Practical 5 (a)	
Question	Working with attributes, terrain Data.
Steps	1. Start new project. 2. Go to Layer -> Add Layer -> Add Vector Layer.  3. Select C:\Users\tyit.VAZEIT\Desktop\jquery&NGT\GIS\GIS_PRactical_DATA_SET\Practical_05\A\ne_10m_admin_0_countries\ne_10m_admin_0_countries.

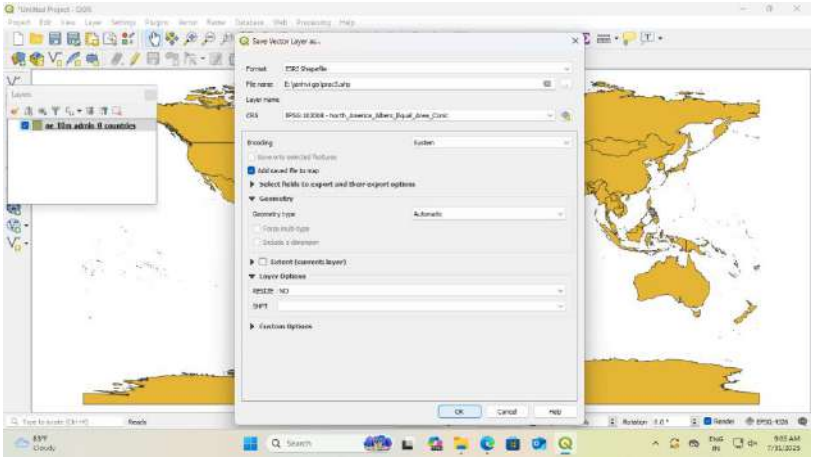


4. Go to Layer -> Save as.

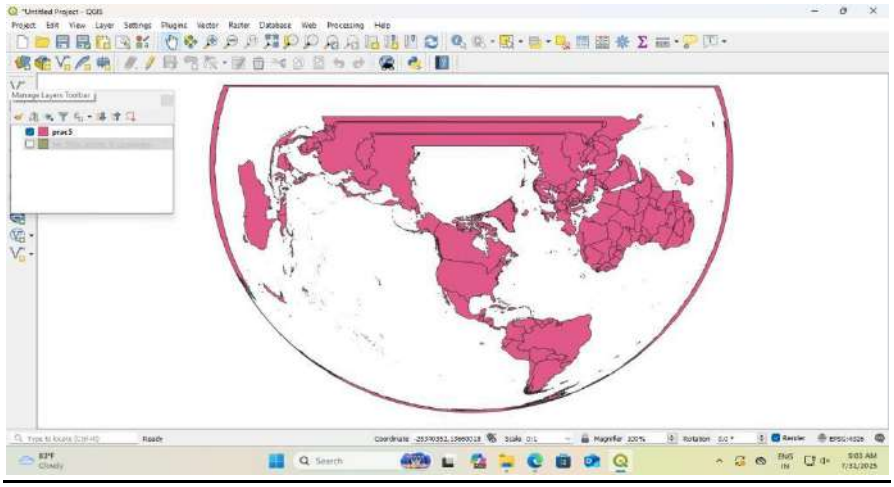


5. Select format as ESRI Shape File

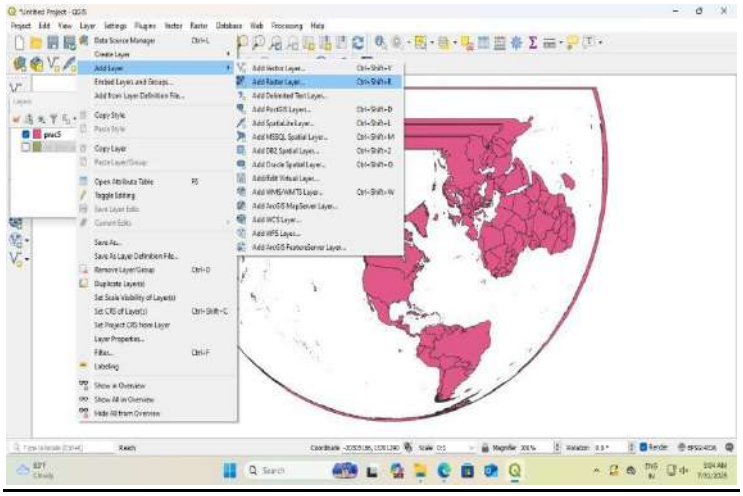
6. Select folder location and file name



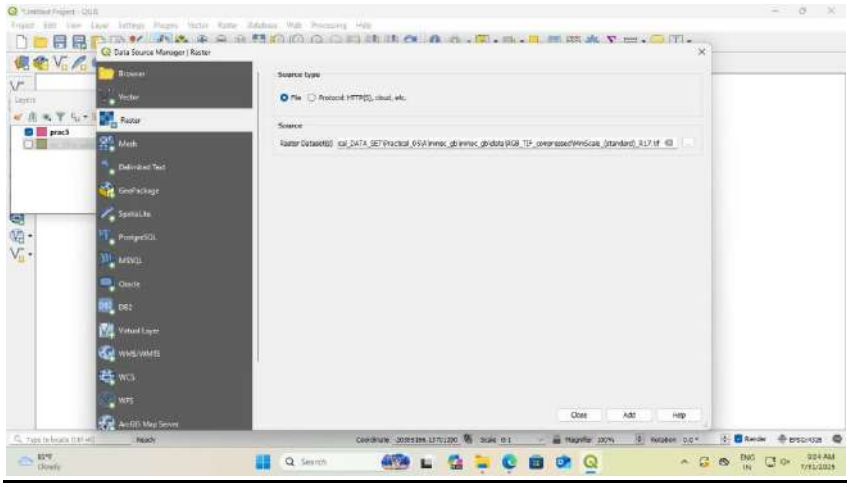
7. Deselect the original image and keep the projected layer visible.



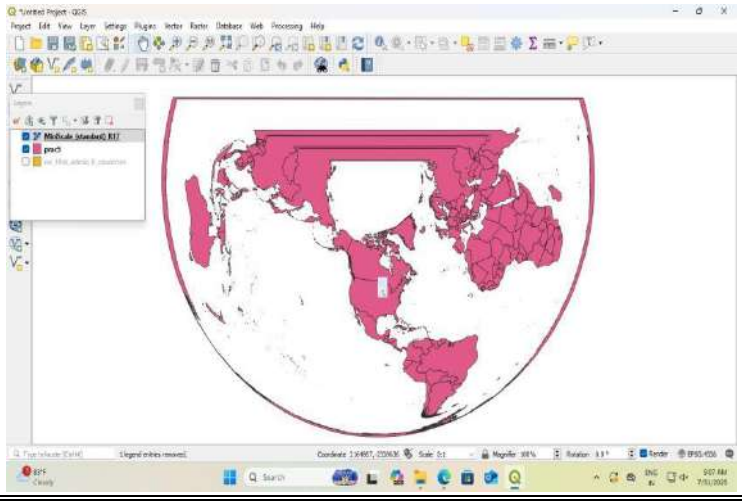
8.Select Layer → Add Layer → Add Raster Layer.

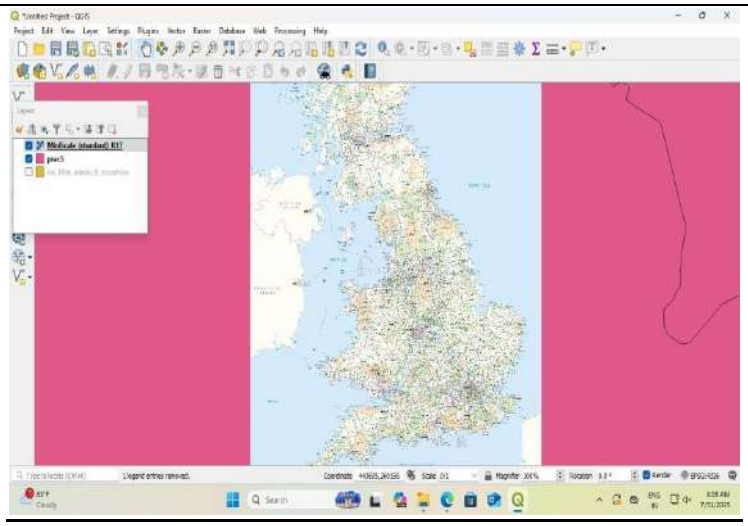


9.Select MiniScale_(standard)_R17.tif from Location.
“GIS_Workshop\Practicals\Practical_05\DATA\minisc_gb\mini sc_gb\d
ata\RGB_TIF_compressed\MiniScale_(standard)_R17.tif” file



10.The Layer appears on a different location than the location where North Amerca is shown on Map.
11.Open Layer Properties→ CRS → North America Grid EPSG 102008.
12. Processing may take some time.
By raster layer covering North America.



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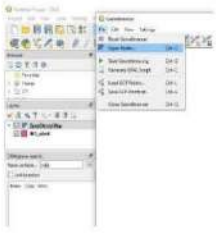
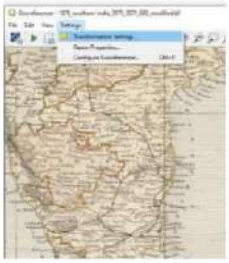
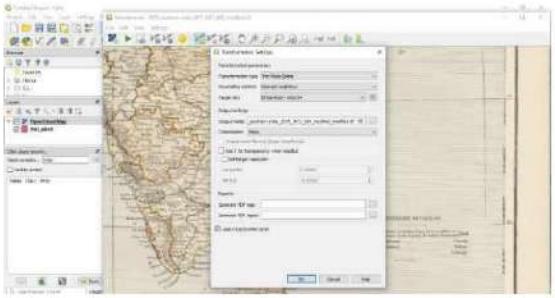
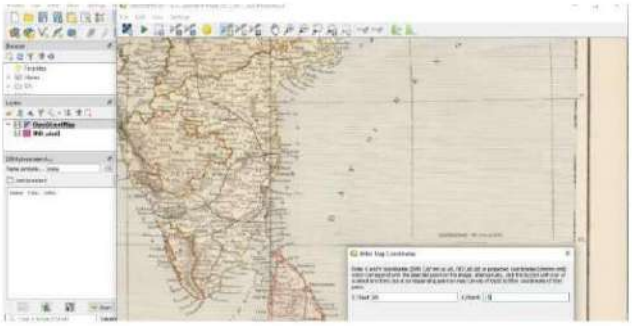
PRACTICAL NO. 6

Practical 6 (a)	
Question	Georeferencing Topo Sheets and Scanned Maps Georeferencing
steps	Go to View -> Panels-> OSM Place Search Go to Layer-> Add Layer-> Add Vector Layer-> Select the D:\TYIT\GIS\Practical_01\D\IND_adm\IND_adm1.shp Go to Web-> OpenLayer Plugin-> OpenStreetMap-> OpenStreetMap Go to Raster-> Georeferencer A dialogue box appear   Go to File-> Open Raster-> Select the file D:\TYIT\GIS\Practical_06\A\1870_southern-india_3975_3071_600. The map appears.

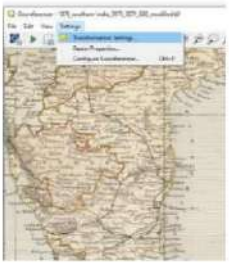
Add the coordinate points as shown:

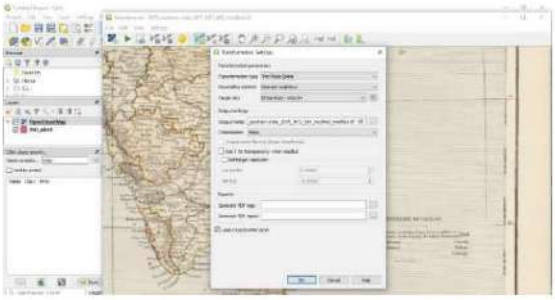


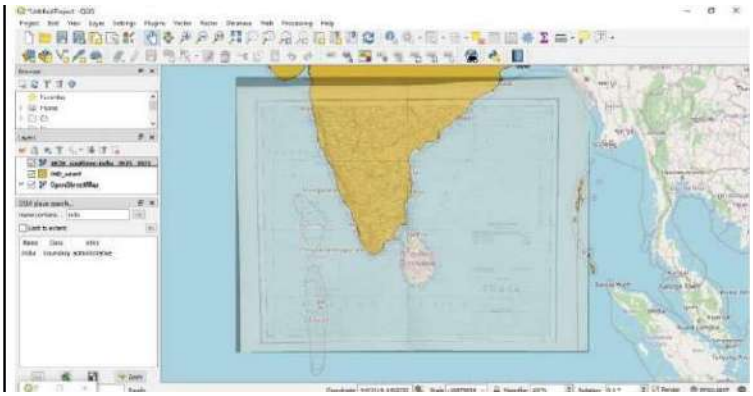


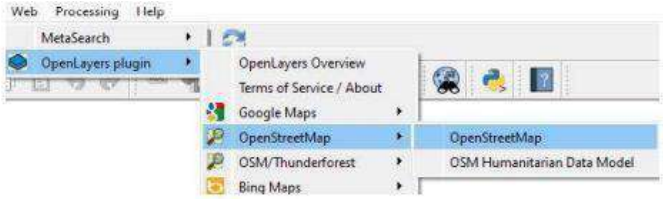
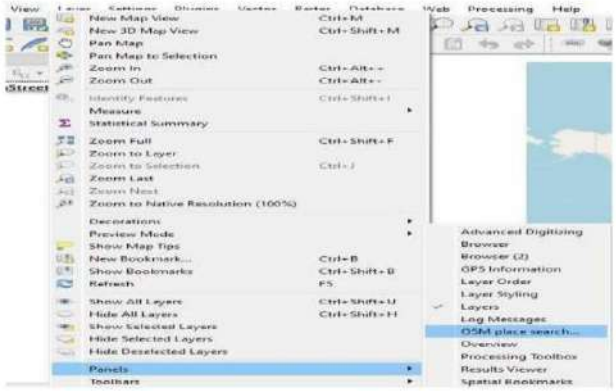


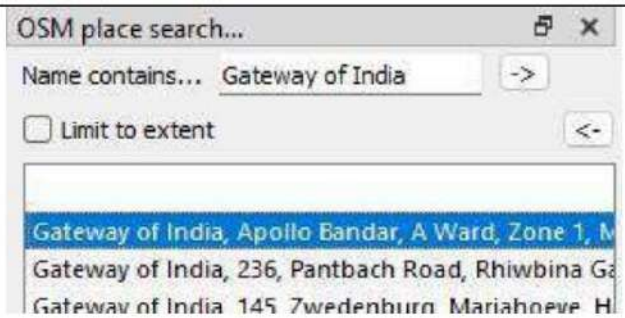
Go to Settings-> Transformation Settings-> And change the settings as shown below:





	Click Ok and run 

Practical 6(b)	Georeferencing Aerial Imagery
steps	1.Install plug-in OpenStreetMap. 2. Go to Web Menu → OpenLayerPlugin → OpenStreetMap→ OpenStreetMap.   3. Go to Project → Properties → Set CRS to EPSG 3857. 4. Go to View → Panels → select OSM Place search  5. The Gateway of India, Mumbai is located at 18.92°N 72.83°E. 6. Search Gateway of India in OSM Search Panel 7.

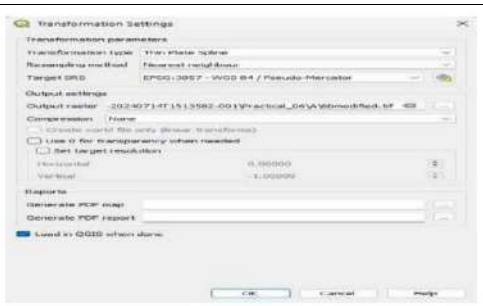


8. Zoom in to appropriate level.
9. The map will appear like this.

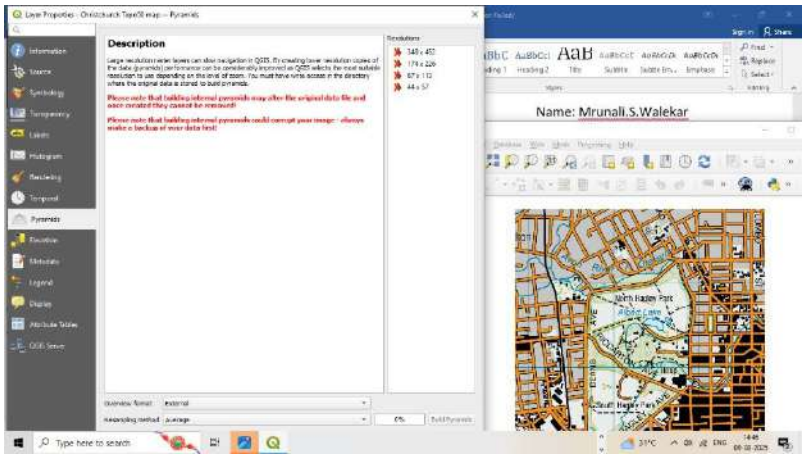
9. Go to Raster → Georeferencer.
10. A new Georeferencer window will open.
11. File → Open Raster.
12. Select file “Gateway_Imagery.tif” from project data folder.

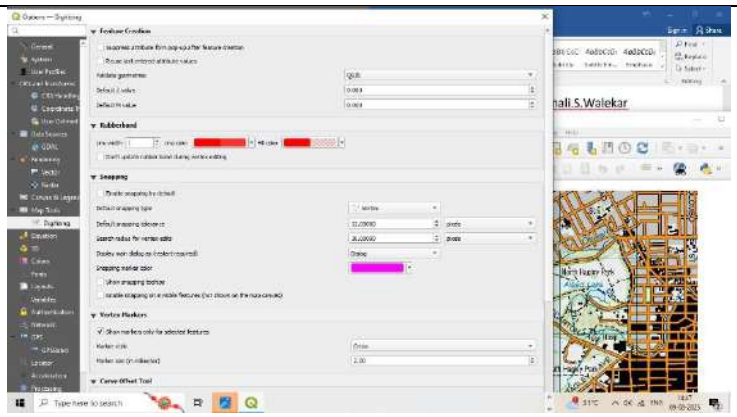
13. Go to Edit → Add Point.
14. Select control points from map (Indicated in red color).
15. Add points in following places:

16. Go to Settings → Transformation settings.



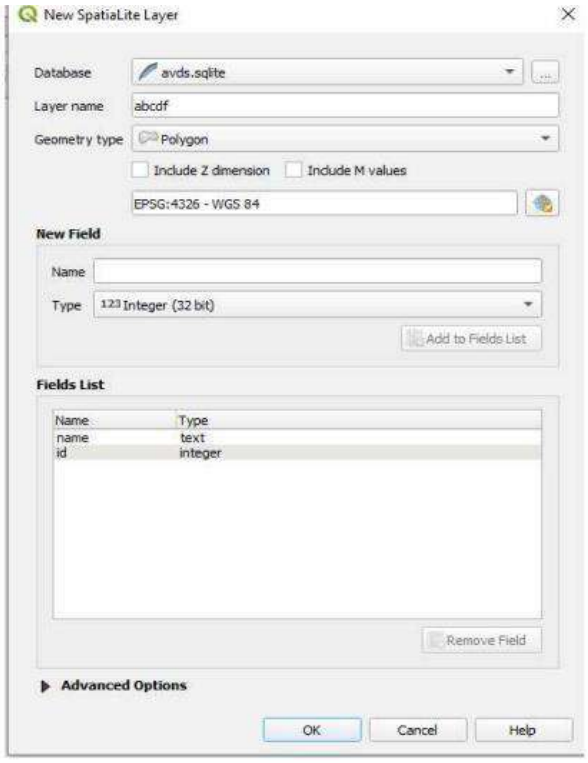
16. Go to File → Start Georeferencing or Press the button in Georeferencing Window. 17. The progress indicator will appear.
18. Observe that the aerial image of the Gateway of India is georeferenced on OSM *in the map canvas.*

Practical 6(c)	Digitizing Map Data
steps	1.Go to layer->Add layer->Select raster layer Select->Chistchurch Topo 50 map.tif->add->ok  2. Right Click layer of chistchurch->go to properties->pyramids->select all Resolutions->build Pyramid->ok  Setting menu->options->Digitizing(in digitizing go to snapping)->select enable snapping by default

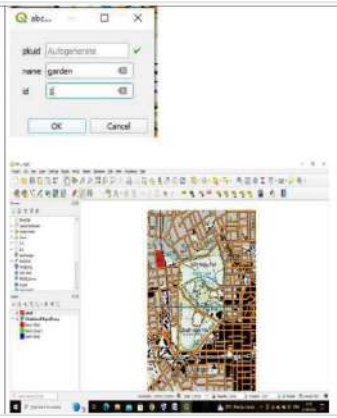


3.Add layer->Create layer->new Spatialite layer->give layer name->select polygon geometry type->click glob symbol->slect 4167->ok Then add field list

i.(name=id,type=whole no)
ii.(name=name,type=text data) Click ok



Go to toggle Editing-> select Polygon->select area to digitize->then right click and give name for->area.

	 abc... pkid Autogenerate name garden id 1 OK Cancel	

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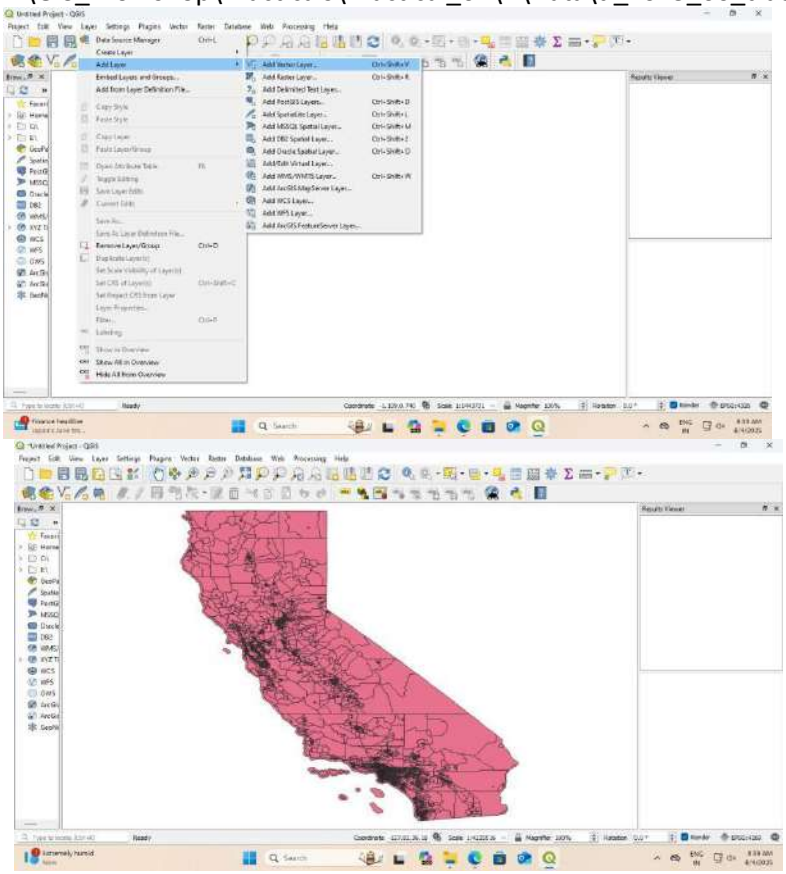
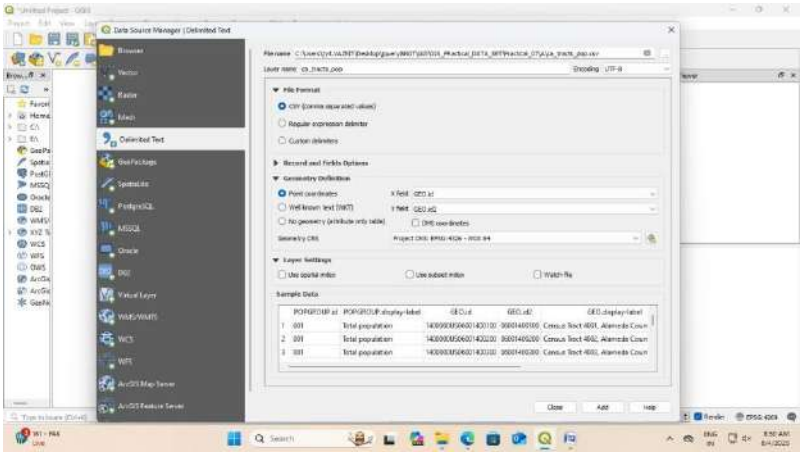
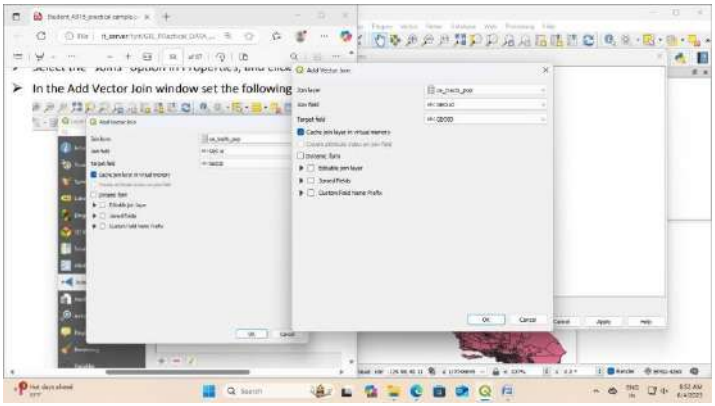
Roll no: A062 Name: Sushant More

PRACTICAL NO. 7

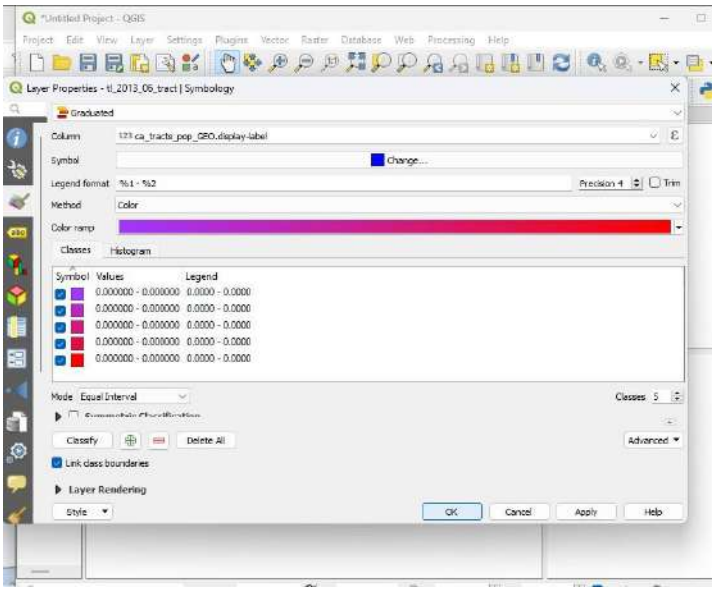
Practical 7	**Managing Data Tables and Spatial data Sets: Table joins, spatial joins, points in polygon analysis, performing spatial queries**
Question	a) Table joins
Steps	➢ Start a new project ➢ Go to Layer → Add Layer → Add new Vector Layer "I:\GIS_Workshop\Practicals\Practical_07\A\Data\tl_2013_06_tract.zip  Go to Layer → Add Layer → Add Delimited Text Layer And add I:\GIS_Workshop\Practicals\Practical_07\A\Data\ca_tacts_pop.csv"

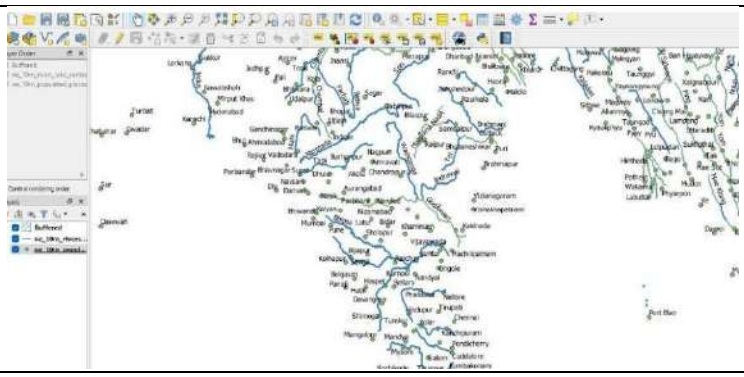


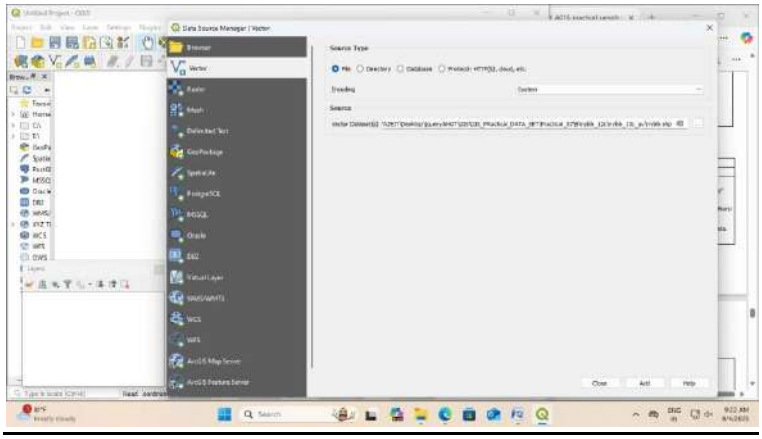
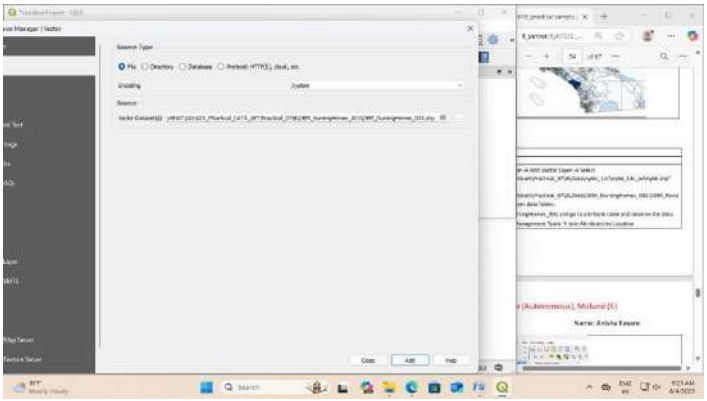
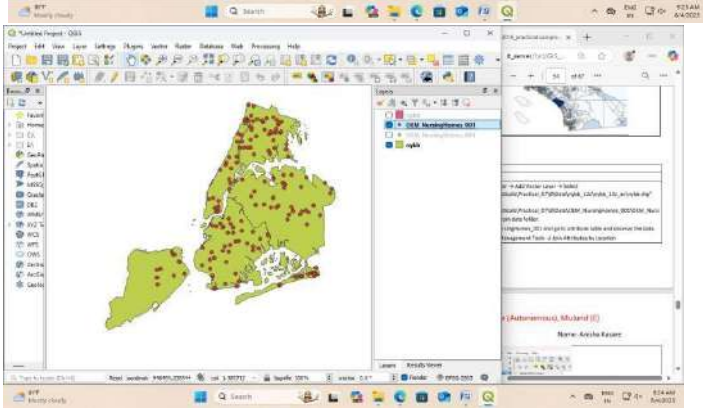
In the layer panel, Right click on “tl_2013_06_tract”, layer and select Properties . Select the “Joins” option in Properties, and click on add button to add new table join

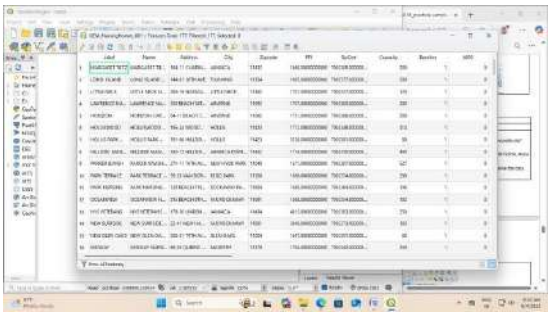


For more clear output, select “tl_2013_06_tact” from Layer Panel, right click and select properties. Go

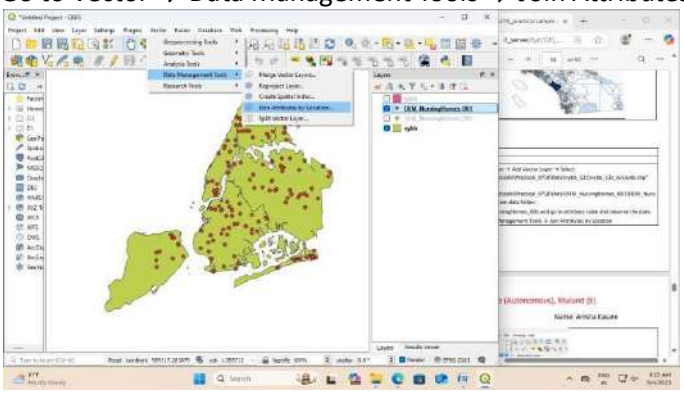


OUTPUT	

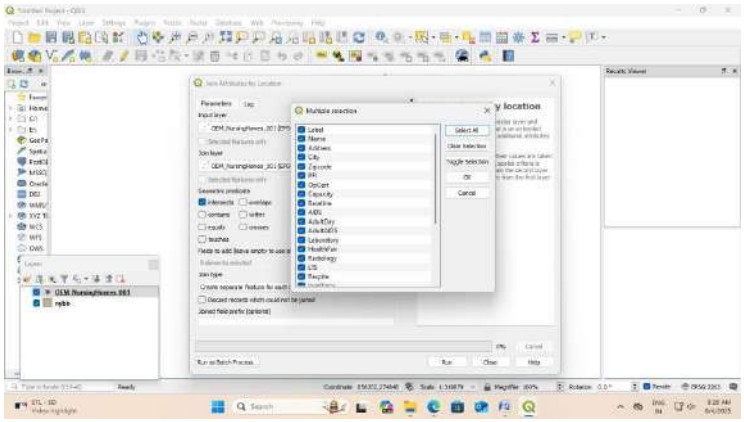
Practical 7(b)	
Question	b) Spatial joins
Steps	Go to Layer → Add Layer → Add Vector Layer → Select "I:\GIS_Workshop\Practicals\Practical_07\B\Data\nybb_12c\nybb_13c_av\nybb.shp"  And "I:\GIS_Workshop\Practicals\Practical_07\B\Data\OEM_NursingHomes_001\OEM_NursingHo mes_001.shp", from data folder.   Right click on OEM_NursingHomes_001 and go to attribute table and observe the data.



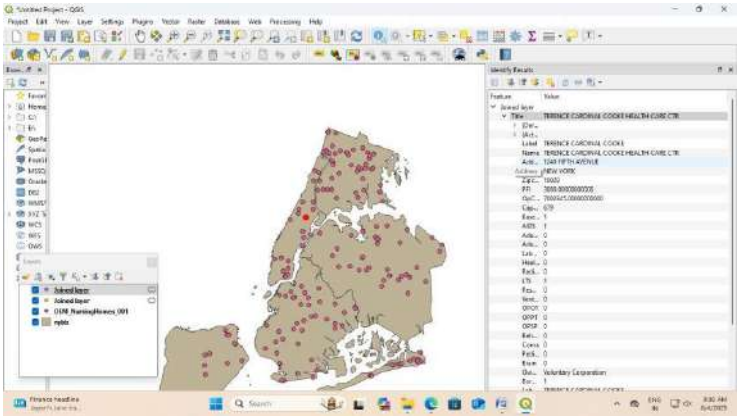
Go to Vector → Data Management Tools → Join Attributes by Location

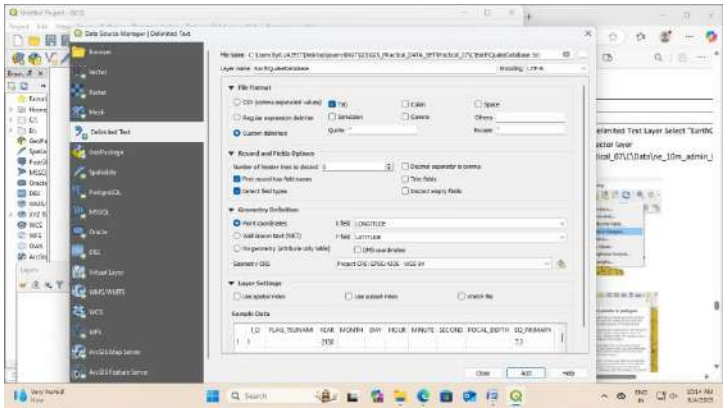
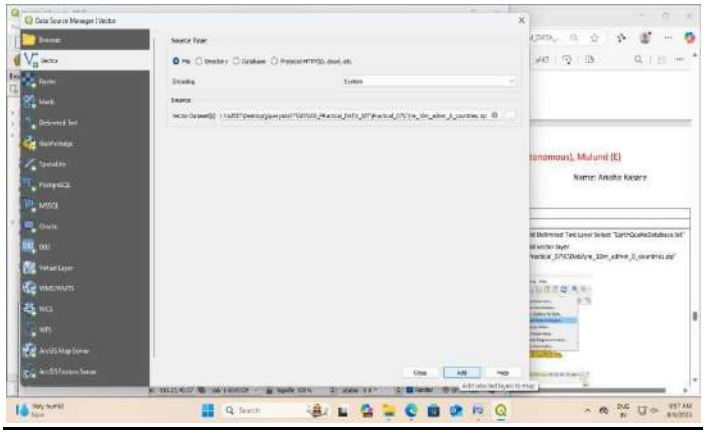


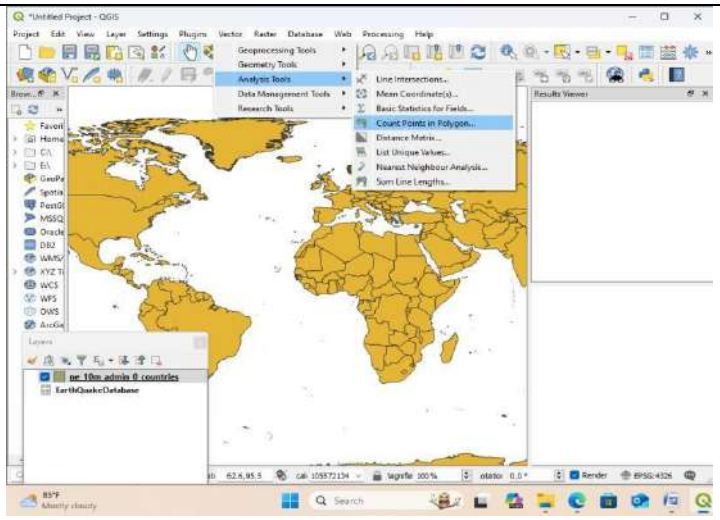
Then



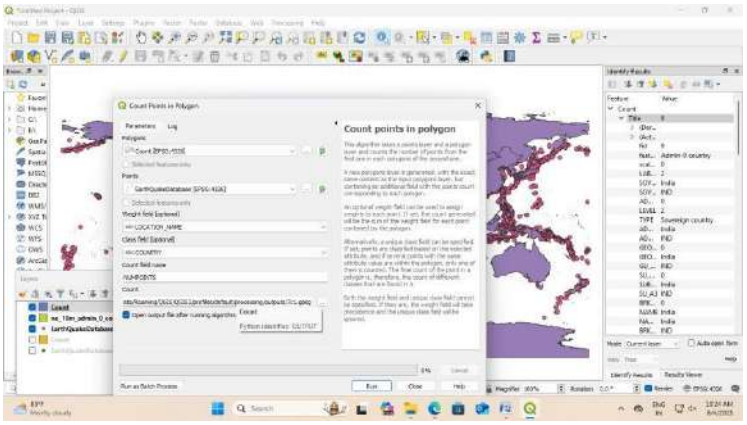
click browse button of field to add. Use the Identify Feature Button to select a region to view join data on map Layer.



Practical 7(c)	
Question	c) Points in polygon analysis
Steps	Go to Layer → Add Layer → Add Delimited Text Layer Select “EarthQuakeDatabase.txt”  Go to Layer → Add Layer → Add vector layer “I:\GIS_Workshop\Practicals\Practical_07\C\Data\ne_10m_admin_0_countries\ne_10m_admin_0_countries.shp”  Go to vector -> analysis tool -> count points in polygon



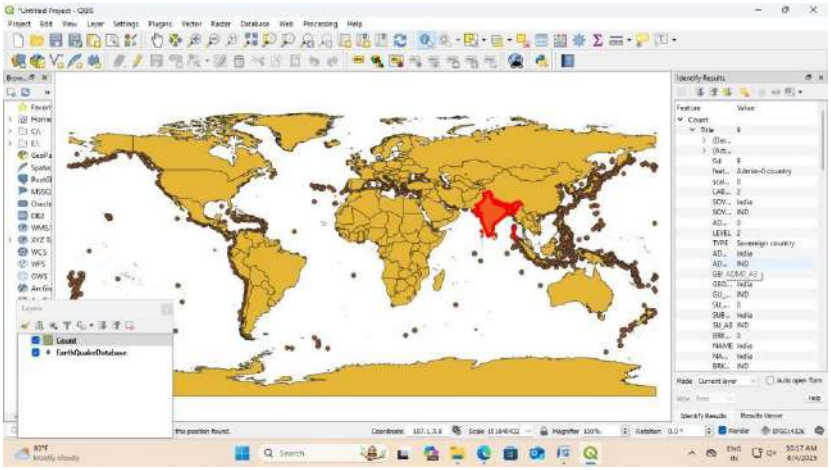
then

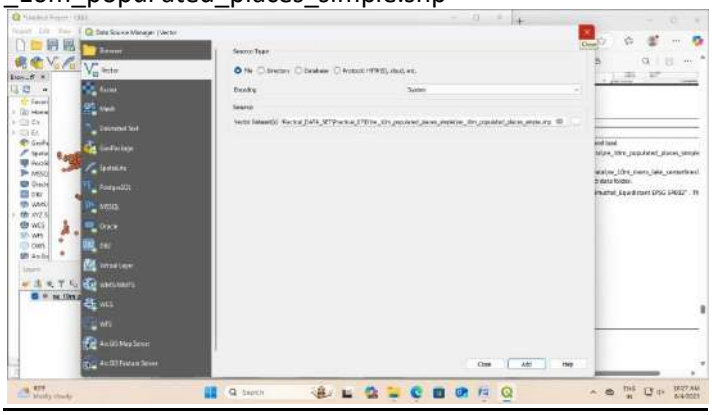
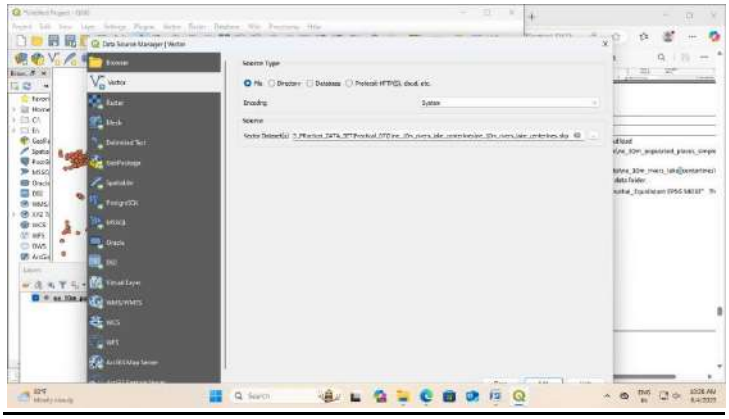
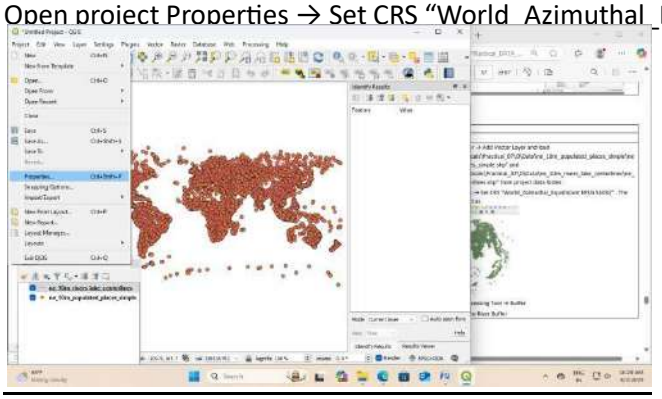


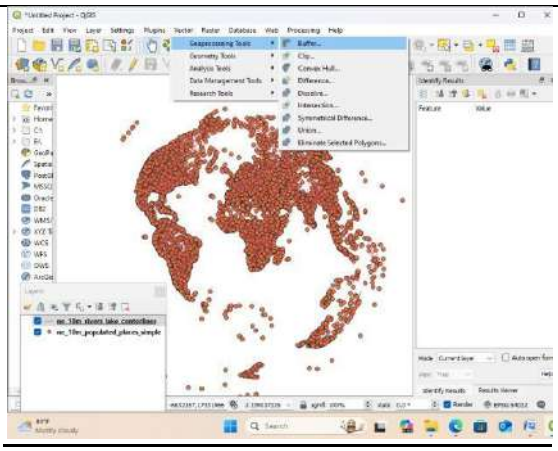
Use the (crsor clicking i aphabet)Identify Feature Button to select a region to view join data on map Layer

Click india

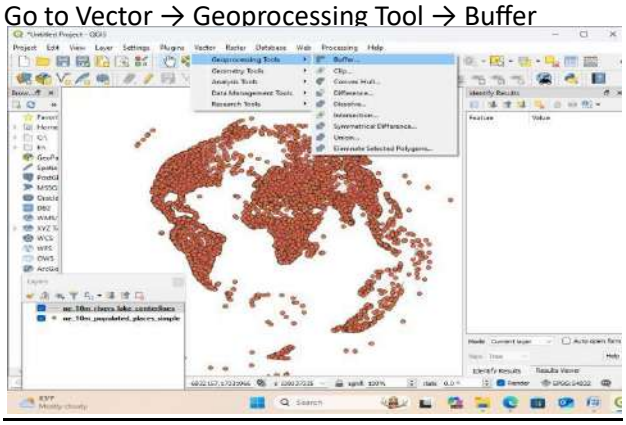
output



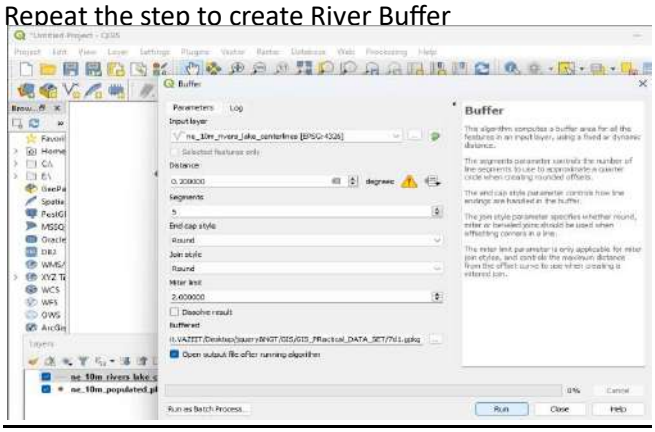
Practical 7(d)	
Question	d) Performing spatial queries
Steps	Go to Layer → Add Layer → Add Vector Layer and load "\GIS_Workshop\Practicals\Practical_07\D\Data\ne_10m_populated_places_simple\ne_10m_popul ated_places_simple.shp"  " and "I:\GIS_Workshop\Practicals\Practical_07\D\Data\ne_10m_rivers_lake_centerlines\ne_10m_rivers _lake_centerlines.shp" from project data folder  Open project Properties → Set CRS "World_Azimuthal_Equidistant EPSG 54032" .  The map will be re-projected as



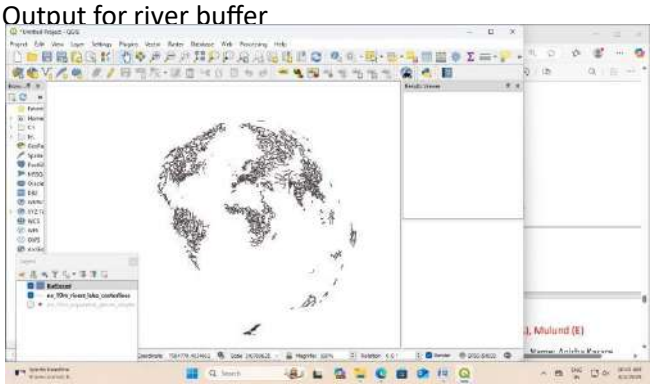
Go to Vector → Geoprocessing Tool → Buffer

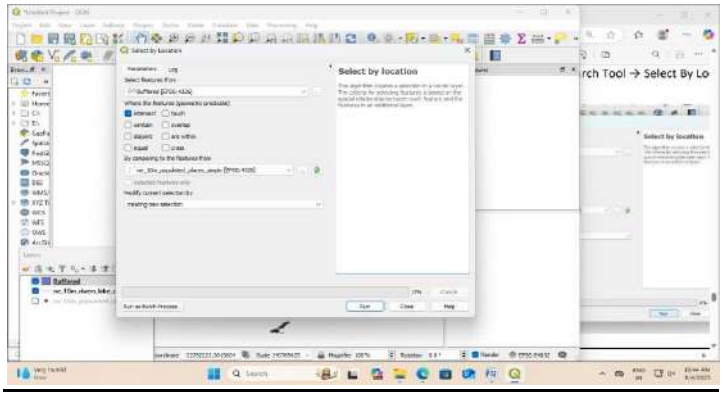
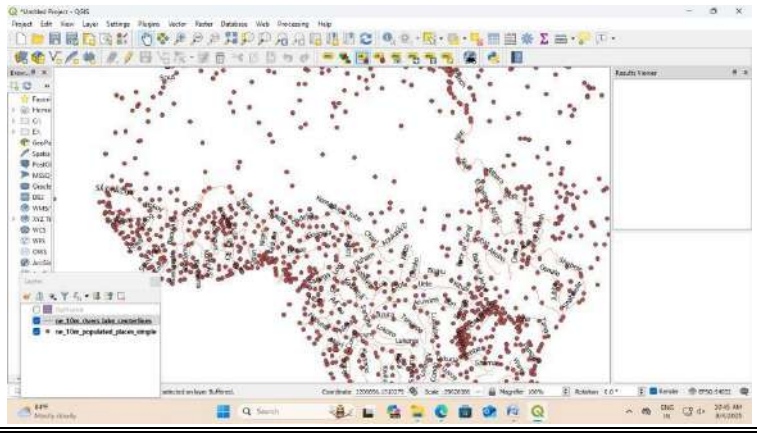


Repeat the step to create River Buffer



Output for river buffer



	Go to Vector → Research Tool → Select By Location  Now click view-> toolbar-> check label toolbar-> write in label field as name By this the rivers name is going to display.
Output	

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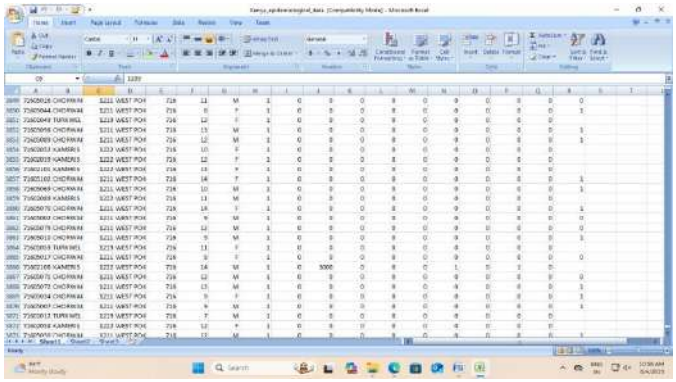
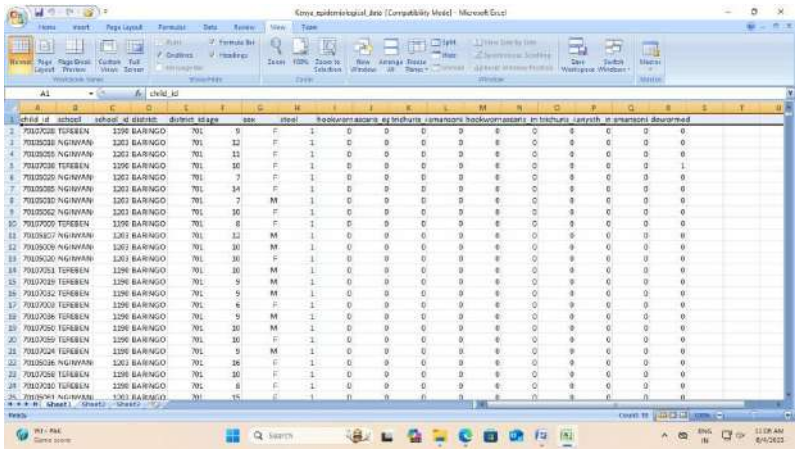
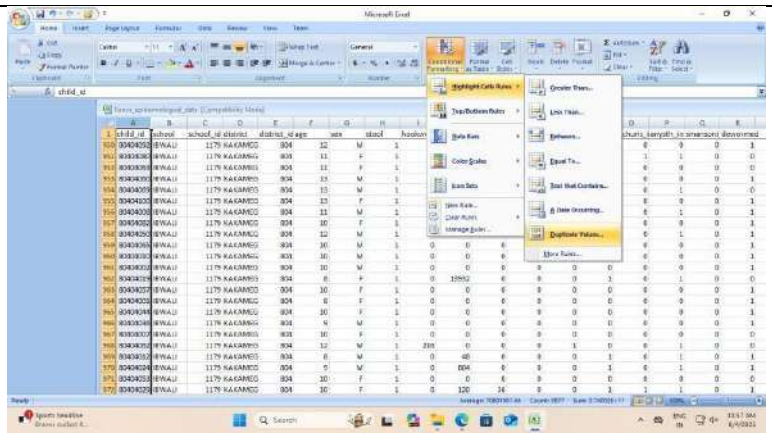
PRACTICAL NO.10

Practical 10	Validating Map data
	The following steps we need to perform in the Stage II of performing Structural Data checks STEPS: 1.Format of the Database 1.1.Open Excel >open file  "kenyel_epidemiological_data" which is in Practical 10 folder.



1.2.Freeze the 1 row>View>Freeze top row .

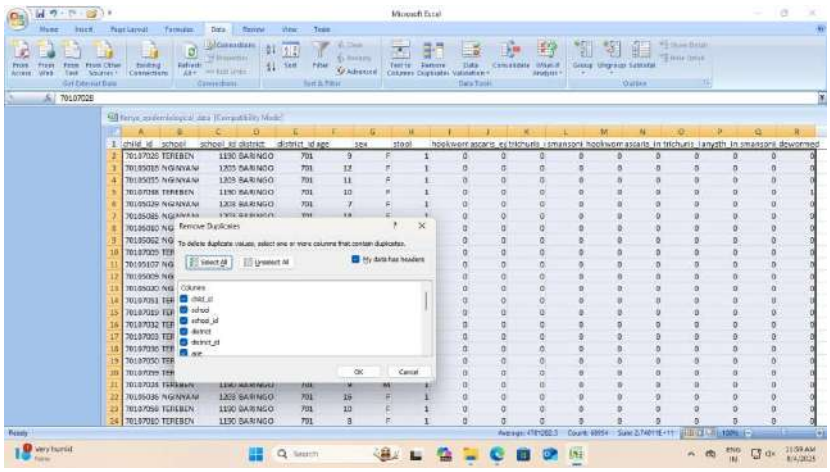
Select child id full>HOME TAB>Conditional formatting>Highlight rules cells>duplicate value>



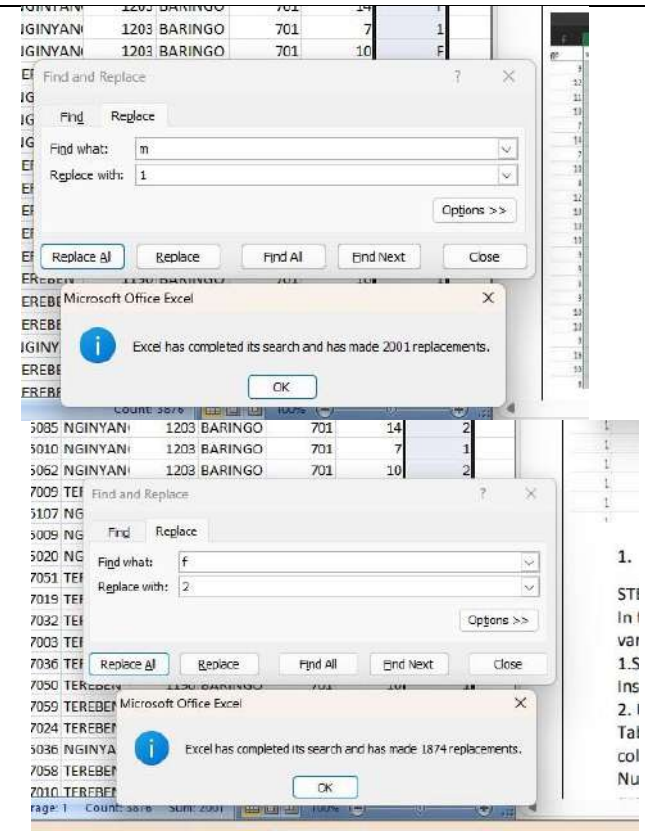
Duplicate values are shown like this

32	70107022	TEREBEN	1190	BARINGO
33	70107002	TEREBEN	1190	BARINGO
34	70105030	NGINYAN	1203	BARINGO
35	70105082	NGINYAN	1203	BARINGO
36	70105081	NGINYAN	1203	BARINGO
37	70105054	NGINYAN	1203	BARINGO
38	70105094	NGINYAN	1203	BARINGO
39	70105094	NGINYAN	1203	BARINGO
40	70105086	NGINYAN	1203	BARINGO
41	70105051	NGINYAN	1203	BARINGO
42	70105012	NGINYAN	1203	BARINGO
43	70105103	NGINYAN	1203	BARINGO
44	70105019	NGINYAN	1203	BARINGO
45	70107066	TEREBEN	1190	BARINGO

A.Removing Duplicates 1. Select all the columns of existing worksheet Now go to Data Tab and select Remove Duplicates.



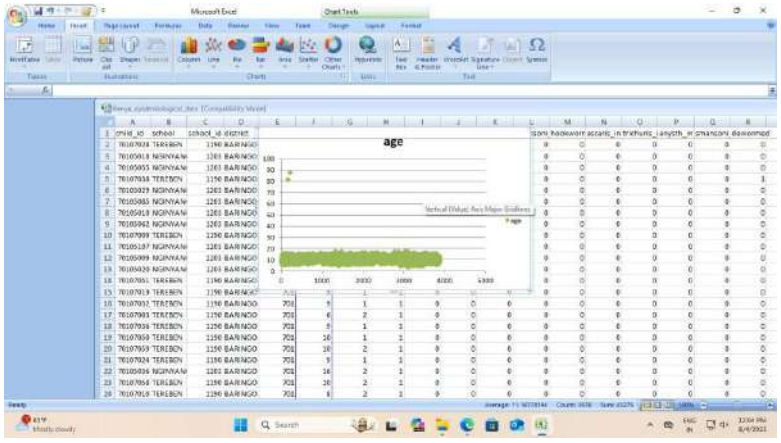
B. Coding of variables In the current worksheet, select the sex column. Now type Ctrl+F and use Replace Function and Replace as follows M-1 F-2



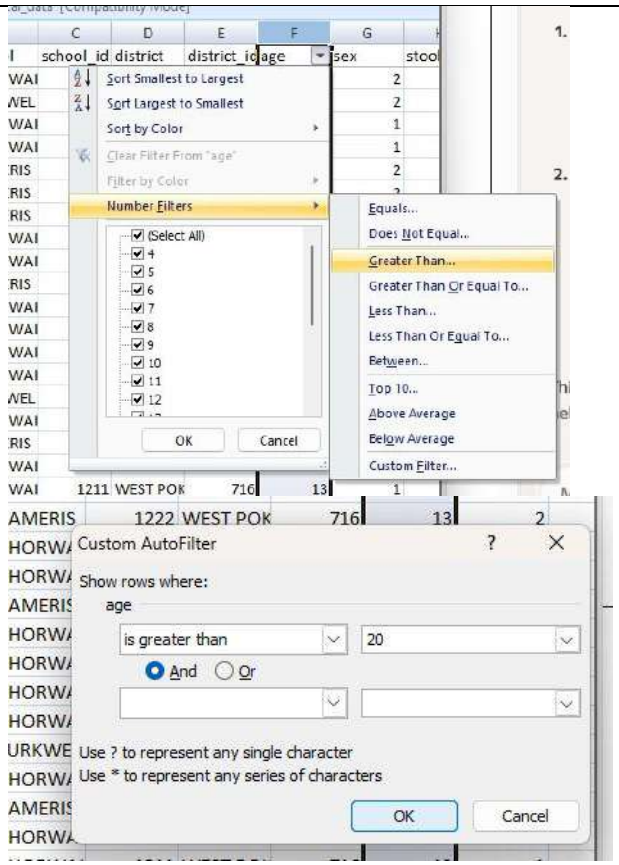
1.Please keep track of how many values are getting replace.

STEPS:2 Verifying the plausibility of data. In this step, we perform two basic operations A. Coding of variables

1.Select the age column in the existing worksheet. Now go to Insert tab and select Scatter.

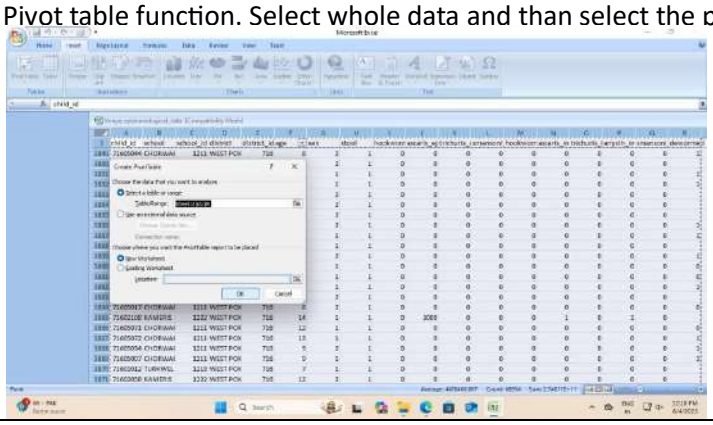


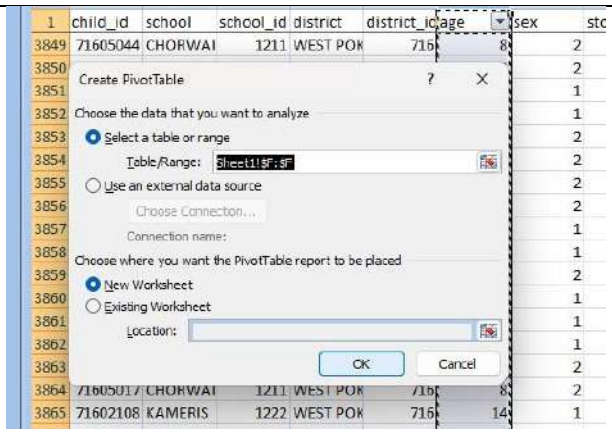
2. Using a filter to detect outliners First go to the Home Tab>Sort and Filter>Filter. Click and apply the filter to all the columns of the worksheet. Now click on age filter and click on Number Filter> Greater Than option and type the value 20 in greater than field.



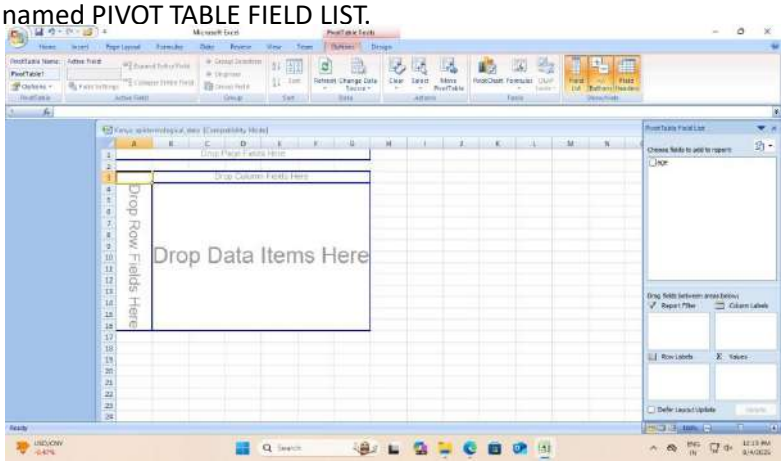
Step 3: Logical Data checks In this step,we perform two basic operations A. Cross Tabulations B. Formulas

4A. Cross Tabulations 1.Open the existing worksheet Now go to Insert Tab and select Pivot table function. Select whole data and than select the pivot table.

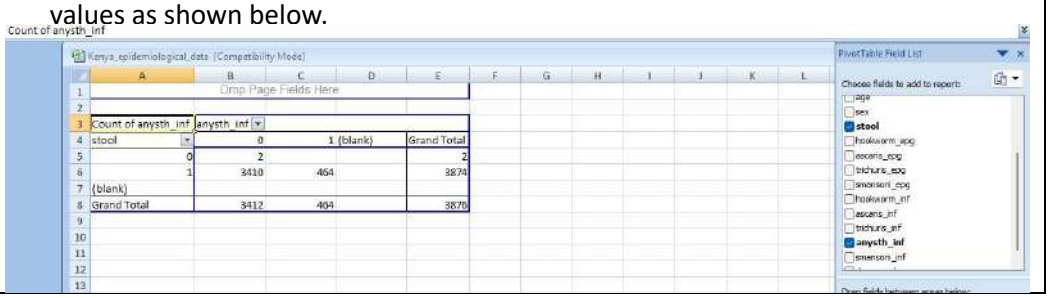


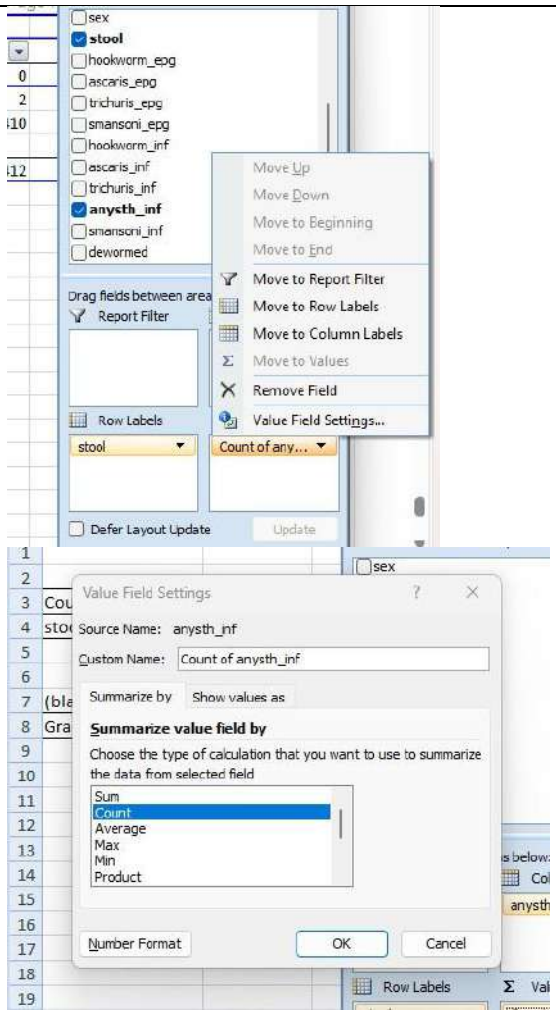


2.An empty table is inserted in a new sheet and a window will open on the right hand side named PIVOT TABLE FIELD LIST.



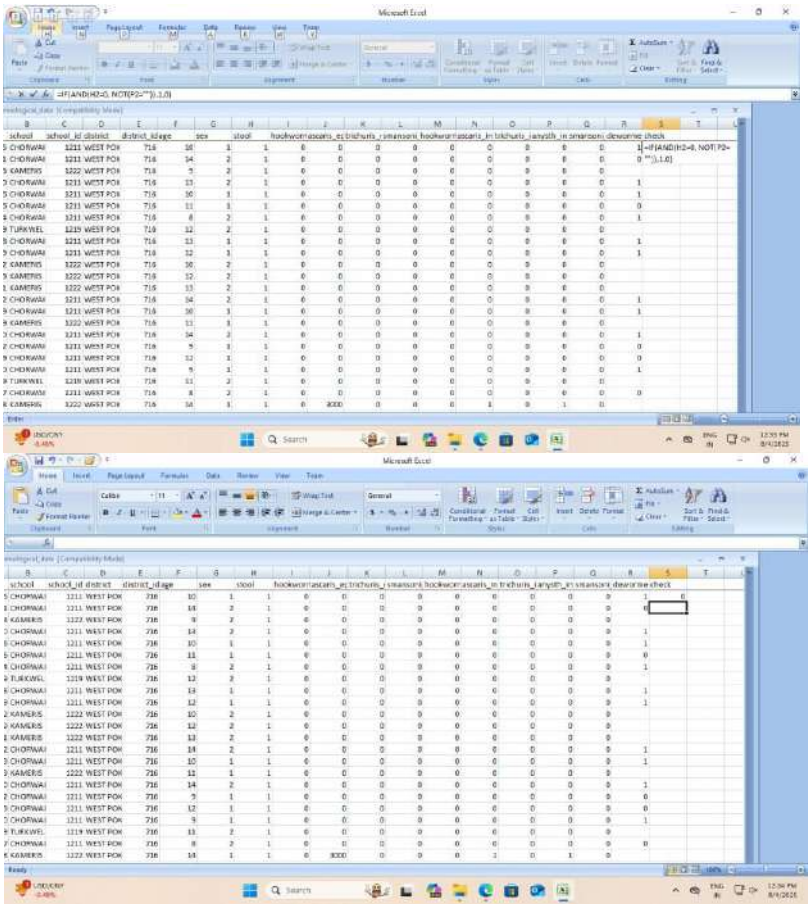
1. From the PivotTable Field List, drag the “stool” item and drop it into the “Row Label” field as show above. Similarly, Click on anysth_inf and draw it into the “Column labels” and “Σ Values” field. To include the count of observations in the table you might need to change the value field settings to count. Click on the combo box Sum of stools and Click on Value Field Settings. Change the value in Summarize value filed by to Count and click OK. Table is updated with count values as shown below.





Formulas

1.Open the existing worksheet Create a new column with the variable called check Type the following formula in S2 column of worksheet =IF(AND(H2=0, NOT(P2="")),1,0).



	Now copy the formula to all other cells (ensure that the formula is copied to all rows in your dataset) Now use the filter to show only entries with a check value of 1. Step 4: Verifying the coordinates of mapping data 1.Create a New Project in QGIS Desktop 3.4.2. Let's add the files! Navigate to Add Vector Layer and add file: Kenya_admin.shp (now here picture will come) 2. similarly, navigate to Add Delimited Text Layer. Here we have to add file: Kenya_school_location.csv. In the Geometry Definition section, there is a field called Geometry CRS, in that we have to select WGS84 as coordinate system. (now here picture will come)