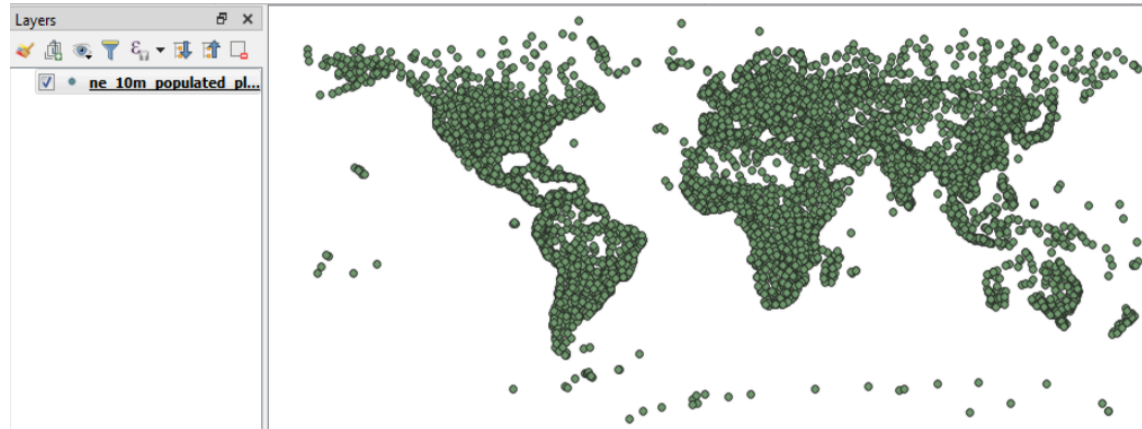


a) Working with attributes

- Start a new project.
- Go to Layer → Add Layer → Add Vector Layer
- Select

"\\GIS_Workshop\\Practicals\\Practical_04\\A\\Data\\ne_10m_populated_places_simple.zip"

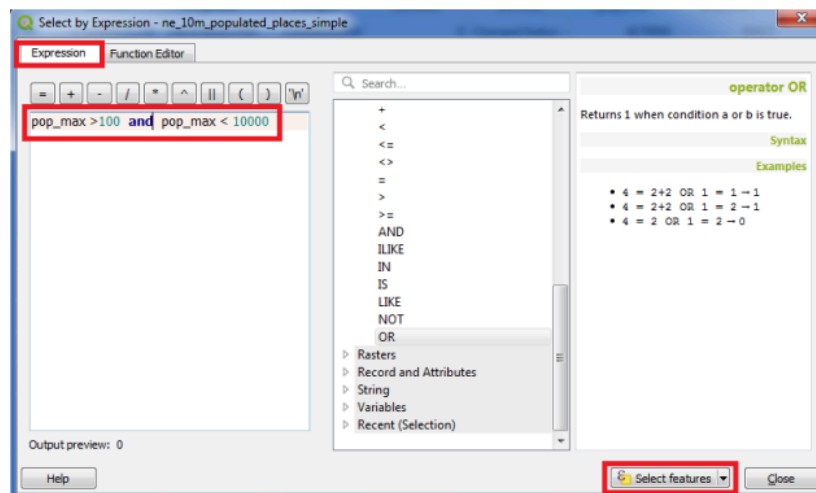



- Right click on Layer in Layer Panel → Open Attribute Table.
- Explore various attributes and their values in the Attribute table.
- To find the Place with maximum population click on "pop_max" file.

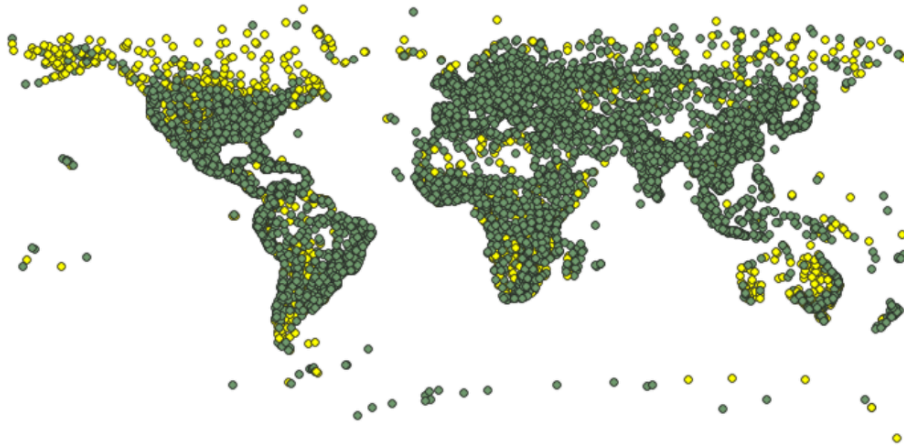
ne_10m_populated_places_simple :: Features Total: 7322, Filtered: 7322, Selected: 0

	latitude	longitude	changed	namediff	diffnote	pop_max	pop_min	pop_other
1	35.68501690580	139.75140742900	0.00000000000	0		35676000	8336599	1294525
2	40.74997906400	-73.98001692880	0.00000000000	0		19040000	8008278	929260
3	19.11211211280	99.13098820170	0.00000000000	0		19020000	10011002	1001011
4	19.01699037570	72.85698929740	0.00000000000	0		18978000	12691836	1242608

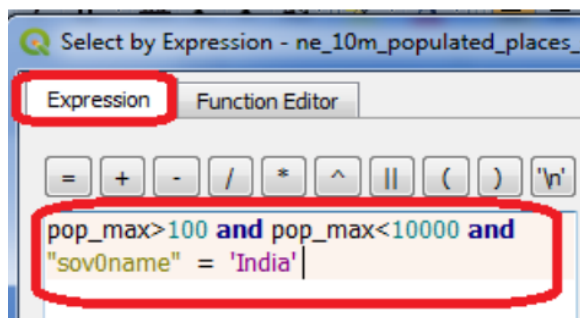
- On clicking the Select feature using expression button the following window will appear.



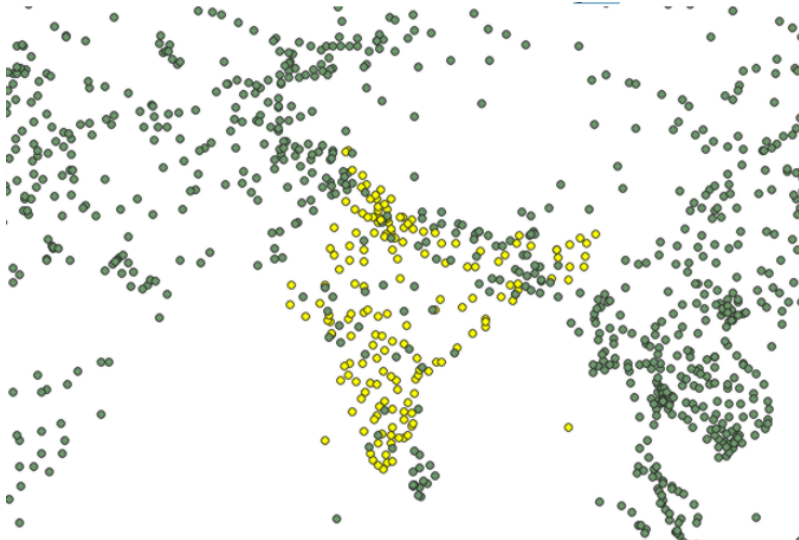
- Enter `pop_max>100` and `pop_max<10000` and click  button to get all the places with population between 100 and 10000.
- The places matching the criteria will appear in different color.




- Different queries can be performed using the dataset.
- Try this:



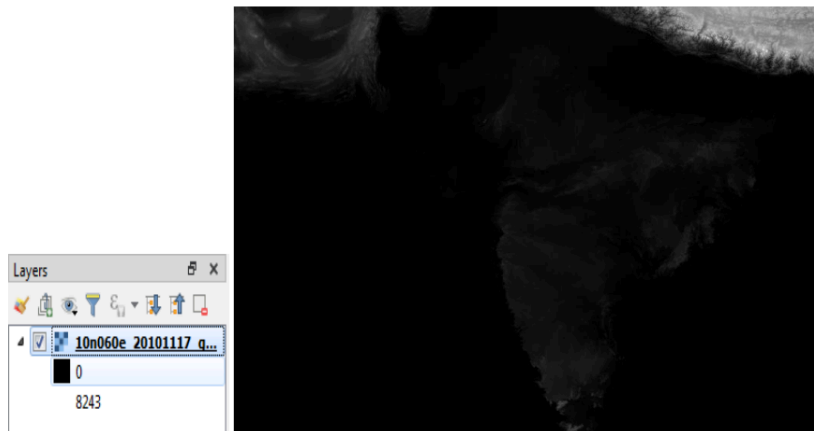
- Will give



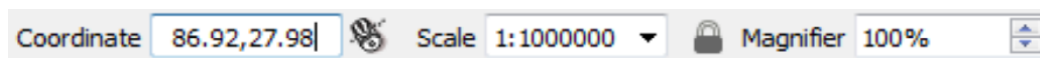
- Use the deselect button  to deselect the feature to be rendered in original color.

b) Terrain Data and Hill shade analysis

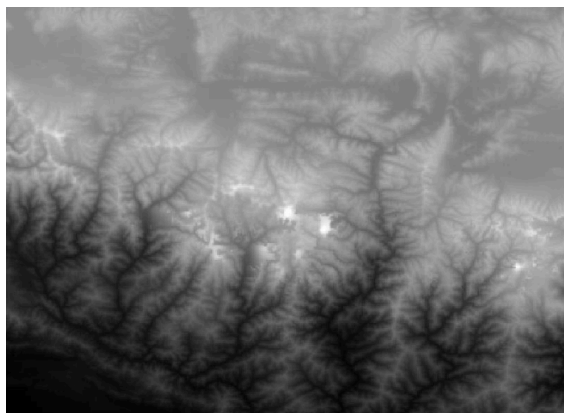
- Go to Layer → Add Raster Layer → select “10n060e_20101117_gmted_mea300.tif”, from Data folder



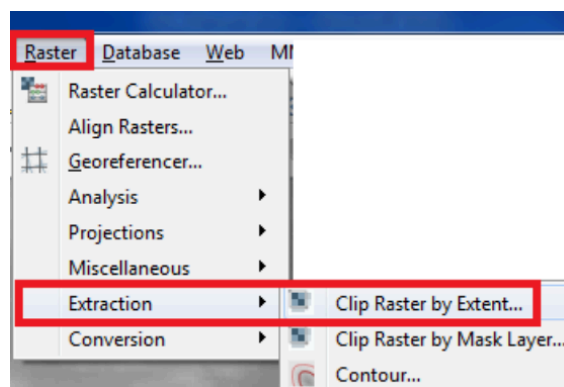
- The Lower altitude regions are shown using dark color and higher using light shade as seen on top region containing Himalaya and Mt Everest.
- Mt. Everest - is located at the coordinates 27.9881° N, 86.9253° E.
- Enter 86.92, 27.98 in the coordinate field, Scale 900000 and Magnifier 100% at the bottom of QGIS.

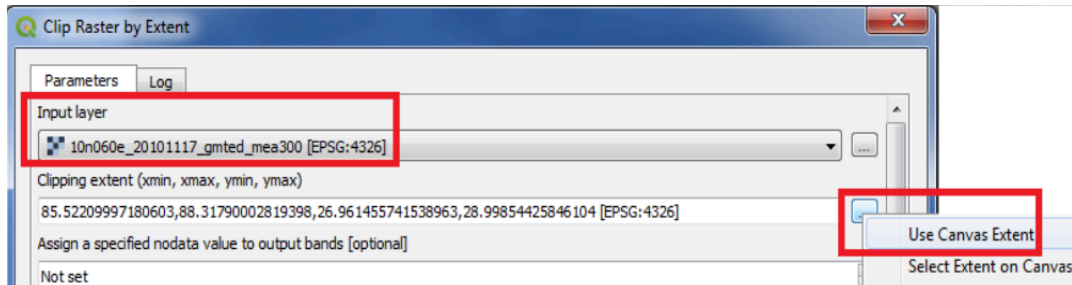


- Press enter the view port will be centered on Himalaya Region.

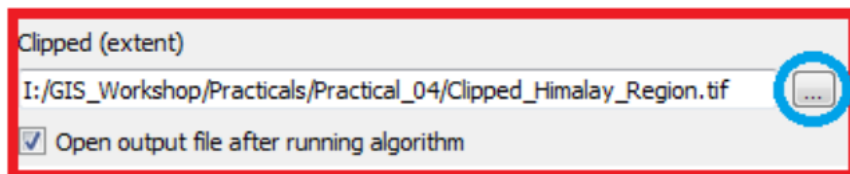


- Crop the raster layer only for the region under study.
- Go to Raster → Extraction → Clip Raster by Extent.

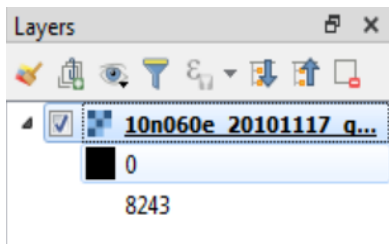




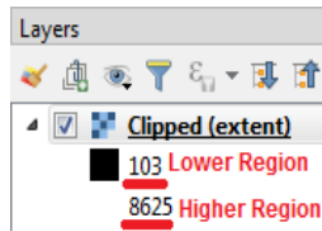
- Select the raster layer (if project contains multiple layers).
- Select the clipping area by selecting the option Use Canvas Extends if the visible part of map is to be selected or manually select an area on canvas by using Select Extent on Canvas.
- Select the location and file name for storing clipped raster layer.



- Press RUN.
- Deselect the original layer and keep the clipped one.
- The Clipped raster layer is representing altitude are from 103 Meters.

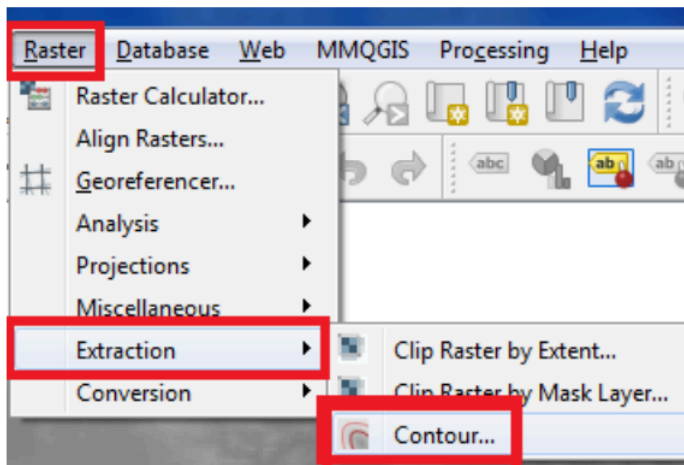


Original Raster

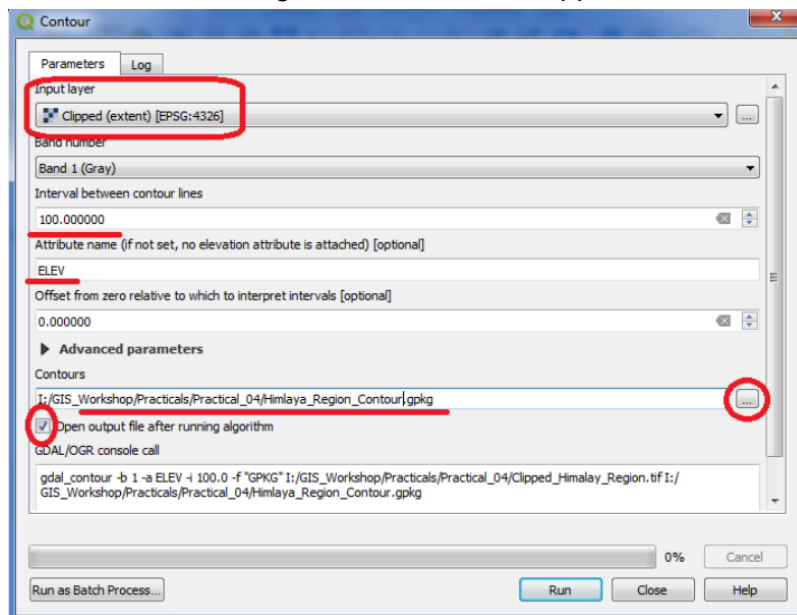


Clipped Raster

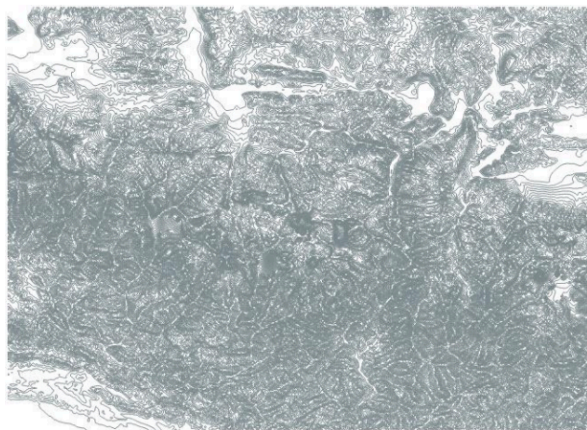
- Counter lines are the lines on a map joining points of equal height above or below sea level. A contour interval in surveying is the vertical distance or the difference in the elevation between the two counter lines in a topographical map.
- To derive counter lines from given raster.
- Go to Raster → Extraction → Contour



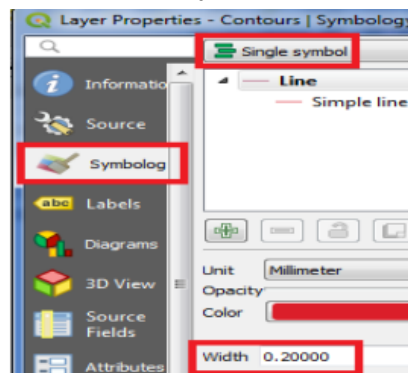
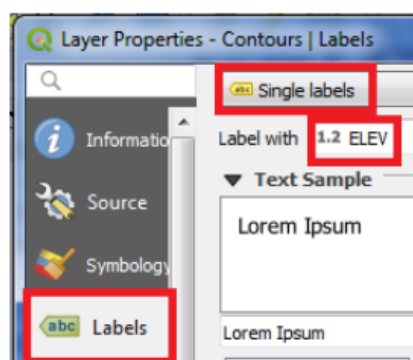
- The Contour configuration window will appear



- Select the input raster layer name. Set contour interval 100.00 meters, select the output file name & location and check the option to add output file to project after processing.
- Press “RUN”.
- The contour layer will appear like this



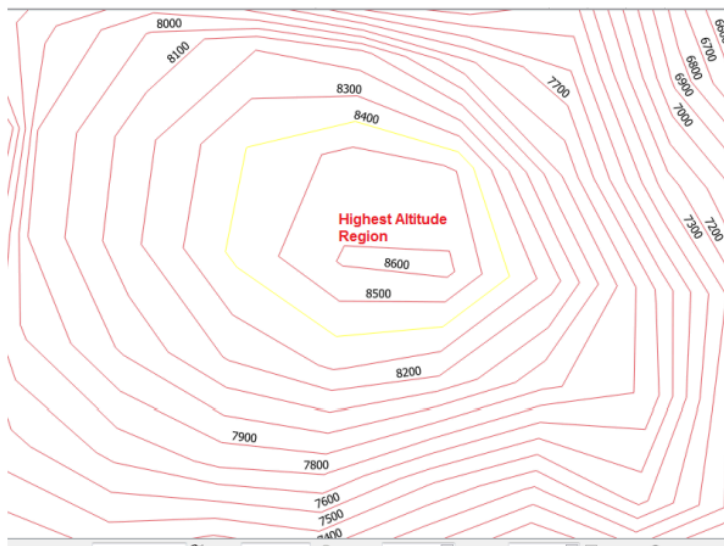
- Label the layer using “ELEV” field and set appropriate symbols for line.



- In the Layer panel right click on Contour Raster Layer and select “Open Attribute table”
- Arrange the table in descending order based on the value of “ELEV” column.

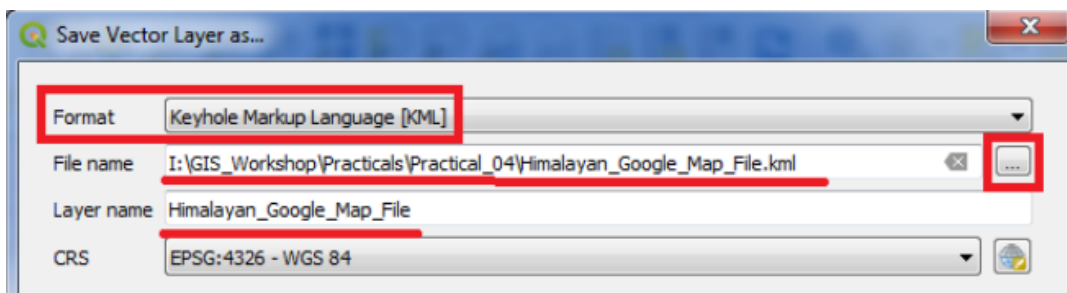
Contours :: Features Total: 4714, Filtered: 4714, Selected: 1

	fid	ID	ELEV
1	1990	1989	8600
2	1989	1988	8500
3	2337	2336	8400
4	2019	2018	8400
5	2336	2335	8300
6	2018	2017	8300
7	2335	2334	8200
8	2017	2016	8200
9	2938	2937	8100
10	2334	2333	8100



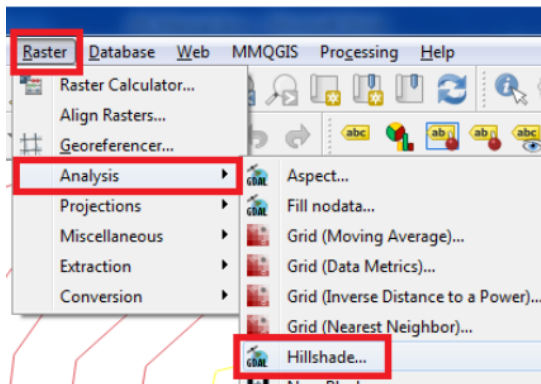
Compare the above counter line raster layer with the previous Google map image or visit <https://www.google.com/maps/@27.9857765,86.9285378,14.75z/data=!5m1!1e4?hl=en-US>

- To verify the above contour files using Google Map
- Make a copy of Contour Layer, Go to Layer → Save As
- Select file format as “Keyhole Markup Language”, set file name, location and Layer Name.
- Also set CRS to WGS 84 EPSG:4326

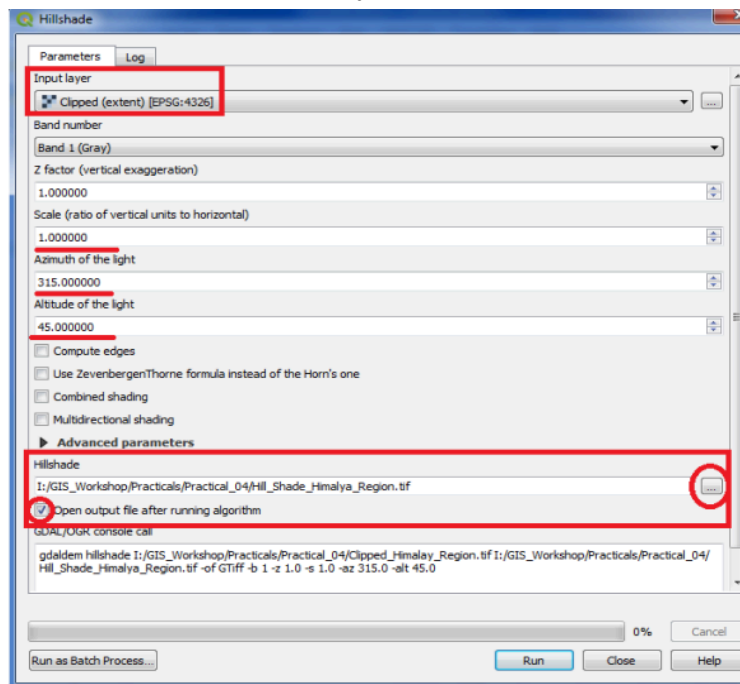


- Go to the stored location on Hard Disk and open the “Himalayan_Google_Map_File.kml” with Google map.

- For Hill Shade surface analysis
- Go to Plugin → Install Georeferencer GADL.
- After successful installation of plugin Go to Raster → Analysis → Hill Shade



- Select the input raster layer, select file name and location for storing Hill Shade output file.



- Press "RUN" and Close the Hill Shape Dialog window.
- After Raster styling the Output will appear like this.

