


Analyzing Census Data




1 Joining a Table to a Layer

1. Open Quantum GIS.
2. Add the “Chitwan_District_VDCs” vector layer to your map.
3. Download the “2001_Census_VDCs_Data.csv” file from my website: <http://rohan.sdsu.edu/~zvoleff>
4. After downloading the file, click on the “2001_Census_VDCs_Data.csv” and hold down the left mouse button. Drag the file onto the table of contents in Quantum GIS.
5. Now right click the “Chitwan_District_VDCs” layer, and choose “Properties”.
6. Click on the “Joins” tab.
7. Click on the plus button that looks like this: .
8. For “Join layer” choose “2001_Census_VDCs_Data”.
9. For “Join field”, choose VDC_NAME.
10. For “Target field”, choose VDC_NAME.
11. Click “OK”.
12. Now if you open the attribute table for your layer, you will see the 2001 population statistics included in the table.
13. Right-click on the layer and choose “Save as” to save the layer as a shapefile. You will now have a VDC shapefile including the population census from 2001.


2 Performing Calculations

Sometimes you need to calculate the length of a line, or the area of a polygon. This is easily done in GIS. **Note: It is very important to choose a projected coordinate system for your map before you calculate lengths or areas – otherwise the units will be in degrees and your results will not make sense.**


1. Start Quantum GIS.
2. Add the shapefile you just made with the 2001 census data joined to the VDC boundaries.
3. To calculate length:

- a. Open the attribute table for the layer, and add a new column named “Length”. See the “Adding a New Column to an Attribute Table” handout to see how to do this. Make the field a “Decimal Number”, with precision of 2.
 - b. Click on the “Field Calculator” button, that looks like this: 
 - c. Check the “Update Existing Field” box, and choose the “Length” field in the dropdown menu.
 - d. Click “Length”.
 - e. Click “OK”.
4. To calculate length (only valid for lines):
- a. Open the attribute table for the layer, and add a new column named “Length”. See the “Adding a New Column to an Attribute Table” handout to see how to do this. Make the field a “Decimal Number”, with precision of 2.
 - b. Click on the “Field Calculator” button, that looks like this: 
 - c. Check the “Update Existing Field” box, and choose the “Length” field in the dropdown menu.
 - d. Click “Length”.
 - e. Click “OK”.
5. To calculate perimeter (only valid for polygons):
- a. Open the attribute table for the layer, and add a new column named “Area”. See the “Adding a New Column to an Attribute Table” handout to see how to do this. Make the field a “Decimal Number”, with precision of 2.
 - b. Click on the “Field Calculator” button, that looks like this: 
 - c. Check the “Update Existing Field” box, and choose the “Perimeter” field in the dropdown menu.
 - d. For the “Field calculator expression”, enter: “\$perimeter”.
 - e. Click “OK”.
6. You can also perform more complicated calculations. We will calculate the number of people per square kilometer in each VDC. To do this we need the shapefile with VDC boundaries and the 2001 census data (see above on how to join the census data).
- a. Open the attribute table for the layer, and add a new column named “PsnPerKm”. See the “Adding a New Column to an Attribute Table” handout

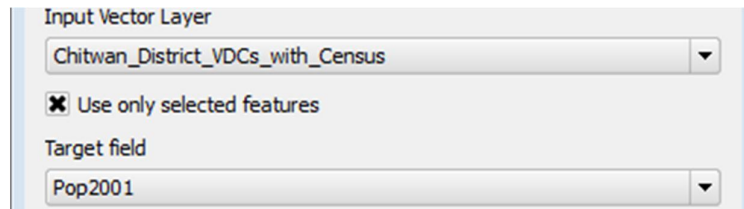
to see how to do this. Make the field a “Decimal Number”, with precision of 2.

- b. Click on the “Field Calculator” button, that looks like this: .
- c. Check the “Update Existing Field” box, and choose the “PsnPerKm” field in the dropdown menu.
- d. For the “Field calculator expression”, enter: “Pop_2001 / (AREA/1000000)” (without the quotation marks). *Note: the (Area/1000000) is to convert the area from square meters to square kilometers.*
- e. Click “OK”.

3 Calculating Basic Statistics on a Shapefile

1. Start Quantum GIS.
2. Add the shapefile with the 2001 census data joined to the VDC boundaries.
3. On the menubar, click “Vector”, then choose “Analysis tools”, then click “Basic Statistics”.
4. For “Input Vector Layer”, choose the VDC boundaries layer that you joined the census data to.
5. For “Target field”, choose “Pop2001”.
6. Click “OK”.
7. The “Statistics Output” box will display basic statistics on the 2001 census of Chitwan, including total population, mean VDC population, standard deviation, etc.
8. For “Target field”, choose “HH2001”.
9. Click “OK”.
10. The “Statistics Output” box will display basic statistics on the 2001 census of Chitwan, including total number of households, mean number of households per VDC, standard deviation, etc.
11. You can also calculate statistics for only a subset of the VDCs:
 - a. Click “Close”.
 - b. Choose “Select Features by Rectangle” by clicking the little black arrow that looks like this: .
 - c. Now click and hold down the left mouse button, and drag the box over a small number of VDCs.

- d. On the menubar, click “Vector”, then choose “Analysis tools”, then click “Basic Statistics”.
- e. For “Input Vector Layer”, choose the VDC boundaries layer that you joined the census data to.
- f. For “Target field”, choose “Pop2001”.
- g. Check the “Use only selected features” checkbox:

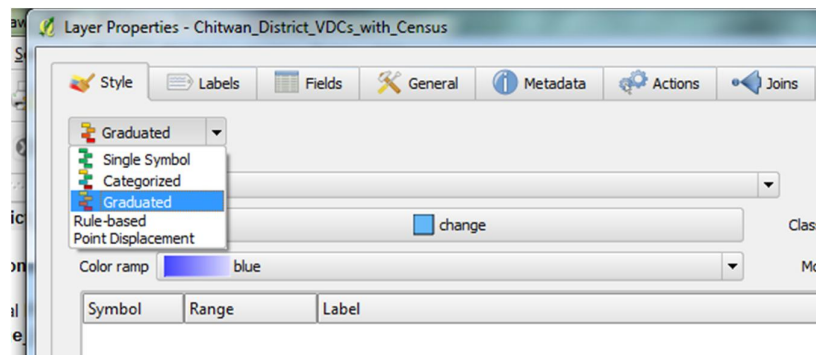


- h. Click “OK”.
- i. Now you will see total, mean, and standard deviation of the population for only the VDCs you have selected.

4 Setting up Graduated Polygon Symbols

Sometimes we want to make a map that shows maps a certain attribute. For example, we might want to color code the VDCs according to their total population. To do this:

1. Start Quantum GIS.
2. Load the VDC layer with the 2001 population census joined to it.
3. Right-click on the VDC layer and choose “Properties”.
4. Click on the “Style” tab.
5. Instead of “Single Symbol”, choose “Graduated”:



6. For “Column” pick “Pop2001” so that we are mapping the 2001 population of each VDC.

7. For “Color ramp”, choose a color bar, or make a new one with “New color ramp...”.
8. Change “Mode” to “Quantile”.
9. Click on “Classify”.
10. Click on “OK” to see your map.
11. You can play around with different color ramps, and different types of classification (under “Mode”) until you get the map you are looking for.

5 Pie Charts and Text Charts

Sometimes we want to make a map that shows the proportion of a number of categories for each polygon. For example, we might want to add a pie chart to each VDC to show the number of women and the number of men resident in that VDC for the 2001 census. To do this:

1. Start Quantum GIS.
2. Load the VDC layer with the 2001 population census joined to it.
3. Right-click on the VDC layer and choose “Properties”.
4. Click on the “Diagrams” tab.
5. Check the “Display diagrams” box.
6. For “Diagram type” choose “Pie chart”.
7. Next to “Fixed size” choose “15” to set the size of the pie charts.
8. Next to “Attributes”:

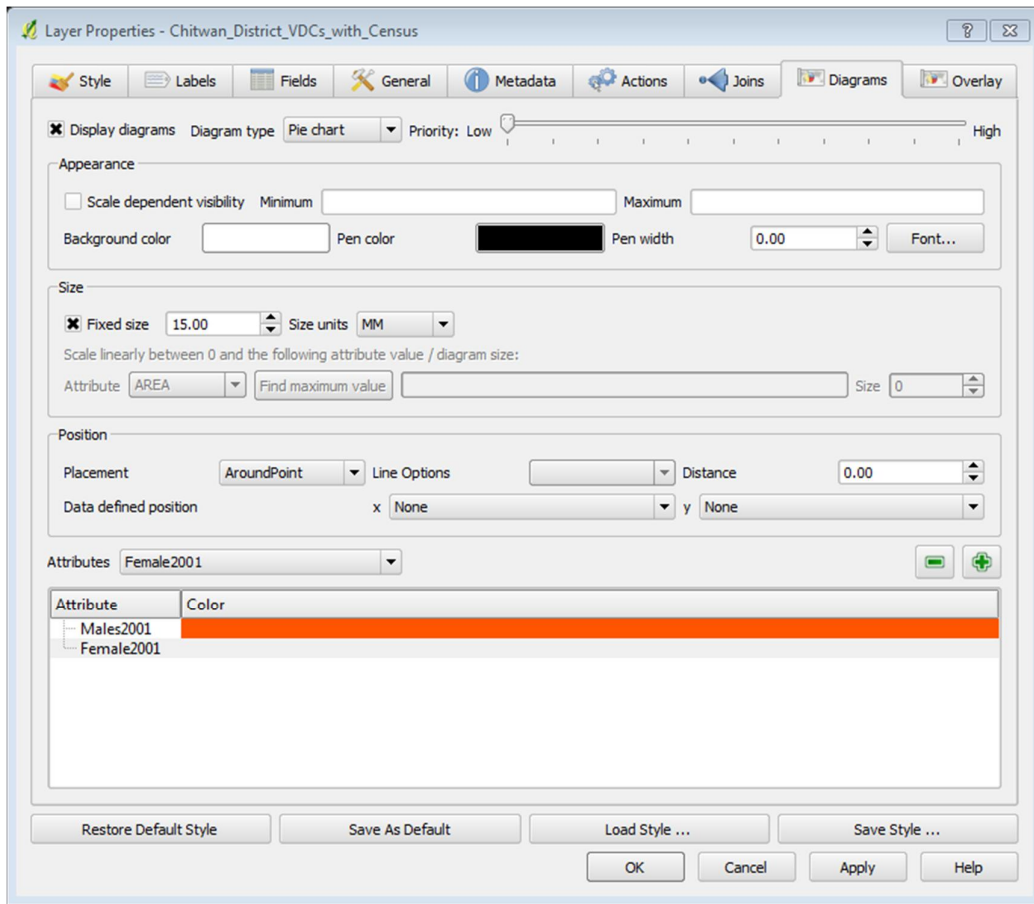
a. First choose “Males2001” and then click the plus button:



b. Then choose “Female2001” and then click the plus button:

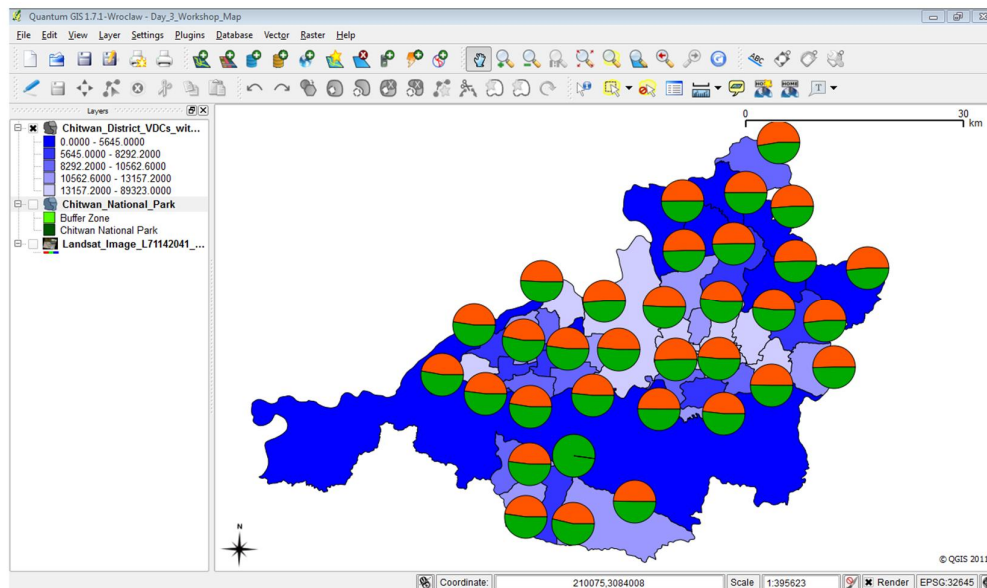


9. You can set the color for males and for females by double clicking on the color under attributes. Set the two colors so they are easy to tell apart.
10. At the end your window should look like this



11. Now click “OK”.

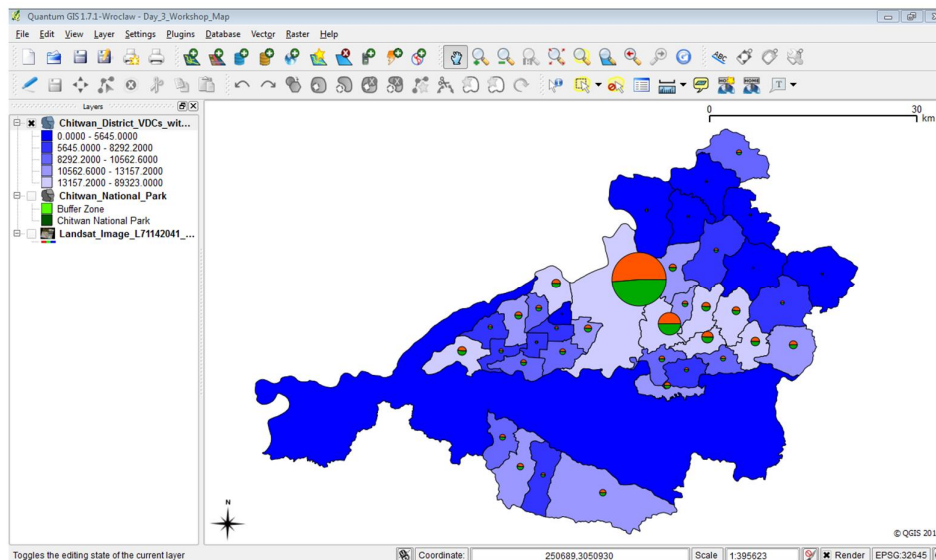
12. Your map will look something like this:



13. We can also scale the pie charts according to the total population of each VDC. This

way we can tell not only the male and female population of each VDC, but we can also compare the VDCs to each other to know the total population.

- a. Right-click on the VDC layer and choose “Properties”.
- b. Click on the “Diagrams” tab.
- c. Under “Size” uncheck “Fixed size”.
- d. For Attribute (again under “Size”) choose “Pop2001”.
- e. Click “Find maximum value”.
- f. Now set the maximum size of the pie chart. For “size” (next to the maximum value box) enter “20”.
- g. Click “OK”.
- h. Now your map will look something like this:



14. We can also do a simpler type of diagram if we just want to see the number of men and women in each VDC.

- a. Right-click on the VDC layer and choose “Properties”.
- b. Click on the “Diagrams” tab.
- c. Under “Size” again check “Fixed size”. Choose a fixed size of “15”.
- d. For “Diagram type” choose “Text diagram”.
- e. Click “OK”.
- f. Now your map will look something like this:

