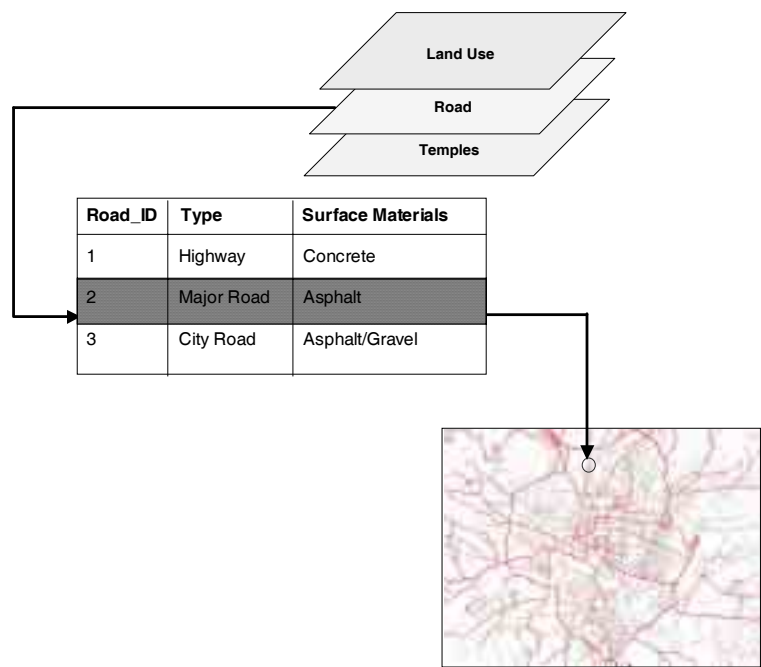


Chapter 2 Finding Answers with Digital Maps

Imagine that you are new to Kathmandu city and you have just arrived at the Tribhuvan International Airport to spend a few days of vacation in Nepal. You did not know where to stay but, with the help of a taxi driver, you have managed to find the Hotel Himalaya in Kopundole. After settling in, some questions have come to mind. Where are the Pashupati Nath and Swayambhu Nath temples that you have read about in a book on holy places? How far are these temples from the Hotel Himalaya? While roaming around Kathmandu city, you saw a tall tower: what is it?

Pulling out a paper map of the new town might give an answer to your questions, but might need a lot of space to unfold your map. With a GIS map of the new town on your computer screen, you can also answer your queries. Answering questions is one of the things a GIS does best.



Exploration 2-What is that?

In exercise 1, you swept your mouse pointer over various features and saw their names pop up on your screen. The tool that does this is called the Map Tips tool. You can set the Map Tips tool to read any of the attributes of a feature.

Step 1

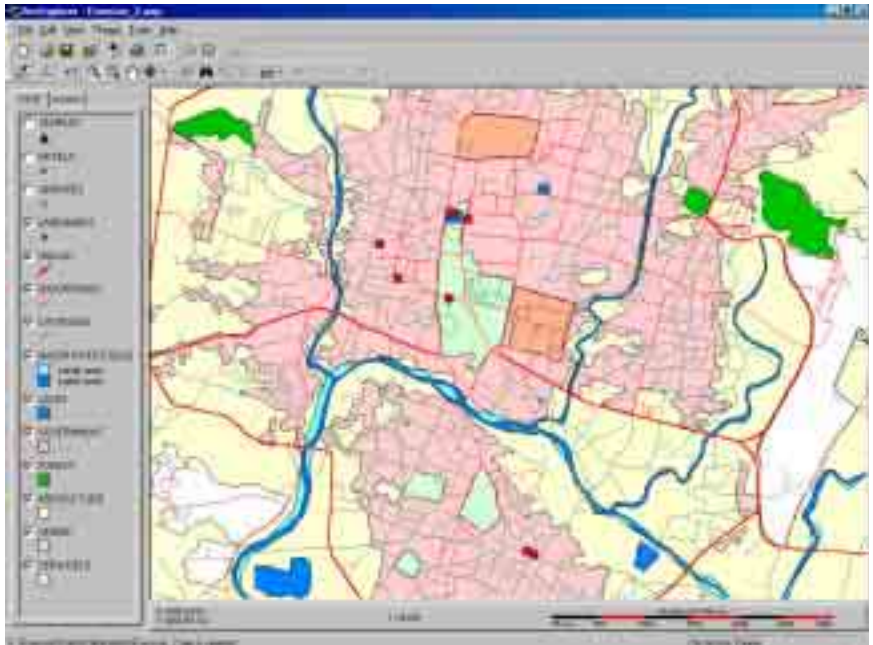
Start ArcExplorer, if necessary.

Step 2

Click the Open Project button. Navigate to the *GIS Basics\Exercise\Data\Kathmandu* directory.

Step 3

Select the project file called *Exercise_2.AEP* and click Open. When you open the project, you see a map view of downtown Kathmandu and Lalitpur city with the themes roads, land use, water body, landmarks, services and hotels.



Step 4

Make the LANDMARKS theme active.

Step 5



Click the Map Tips tool. The Map Tip Field Selection dialogue box appears. This allows you to choose which attribute you want to pop up when you pass the mouse pointer over a particular element.

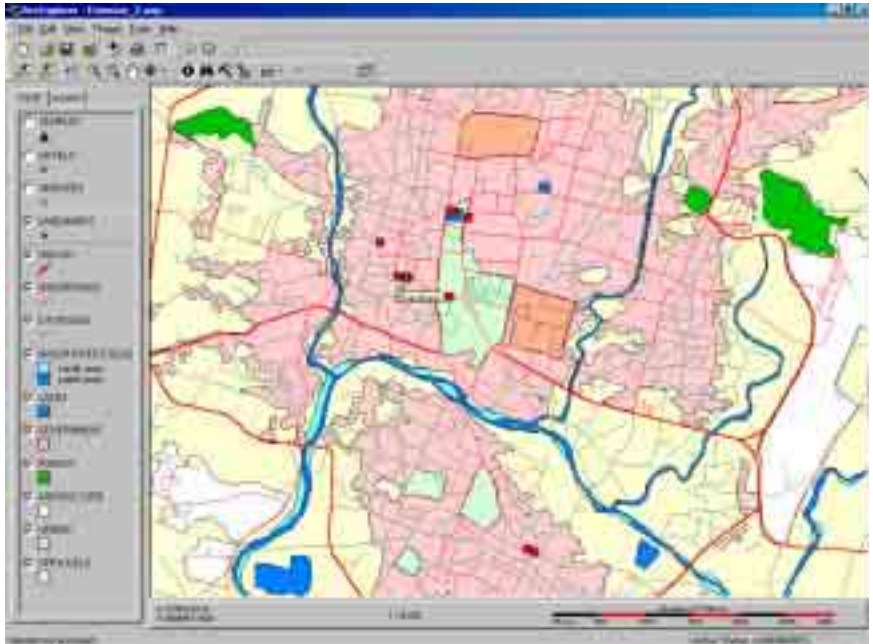
Step 6

Choose the NAME field and then click OK. The name of a particular landmark will appear when you pass your mouse pointer over it.



Step 7

Drag the mouse pointer over all the landmarks and read their names.

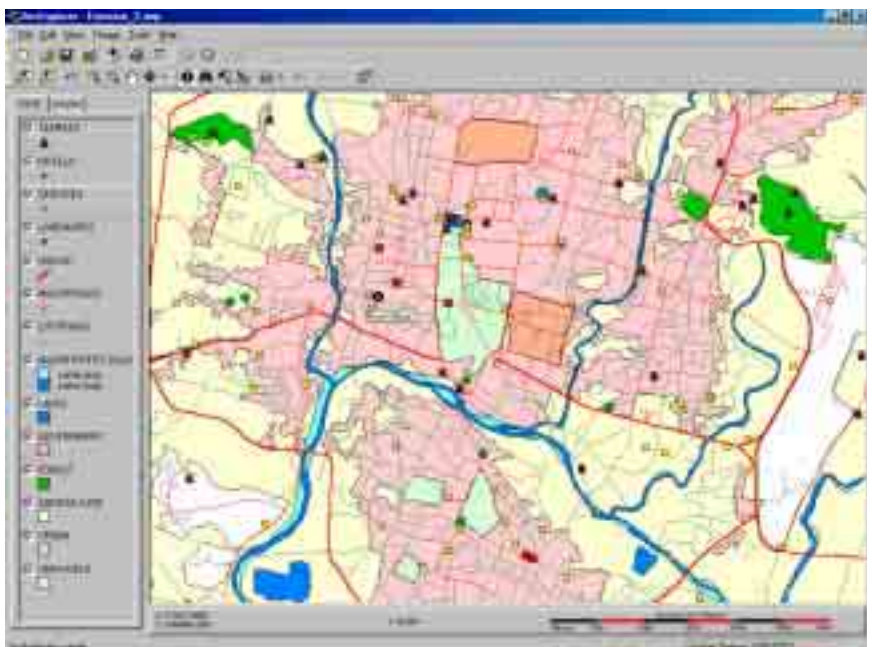


Step 8

Turn on the SERVICES, TEMPLES and HOTELS themes.

Step 9

Make the SERVICES theme active. Use the Map Tip tool to identify different types of services.



Step 10



You can also use the Identify button to learn about the features. Make the HOTELS theme active. Click the Identify button and move your mouse pointer into the map view and click randomly on some hotels.

The Identify Results dialogue box will appear and list all attributes of the hotel you clicked.

Close the Identify Results dialogue box by clicking the 'x' in its upper right-hand corner.



Exploration 3-Where is it?

Map Tips and Identify tools give you information about places you point to on the map. However, sometimes you will already have information about a place, and you want to find it on the map. For instance, as we assumed earlier, you are staying at the Himalaya Hotel and you want to visit to Pashupati Nath and Swayambhu Nath temples. So, you want to see on the map where the Himalaya Hotel, Pashupati Nath and Swayambhu Nath temples are located. To do this you will use the Find tool.



Step 1

Click the Find button. The Find Features dialogue box displays.



Step 2

Type Himalaya into the text box. Note that the Find tool is case sensitive, so make sure you enter the text exactly as shown.

Step 3

Since we did not enter the full name of the hotel, select Any Part of Field in section 2 of the dialogue box.

Step 4

Choose HOTELS as the theme to search in section 3.

Step 5

Click the Find button. ArcExplorer searches the features in the HOTELS theme and gives a list of matches.

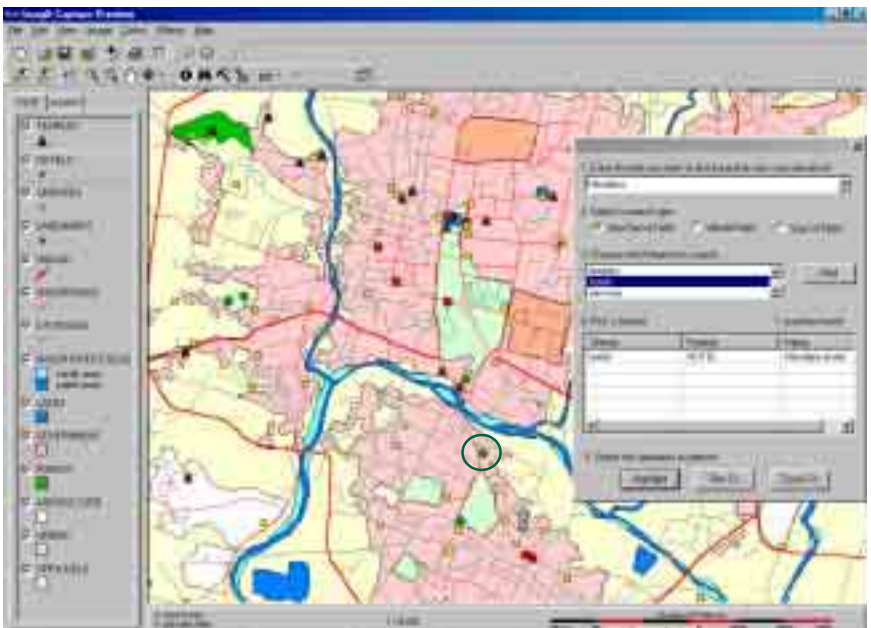
Step 6

Click on the match for Himalaya Hotel to highlight it. You will see that the Highlight, Pan To and Zoom To buttons are darkened now.



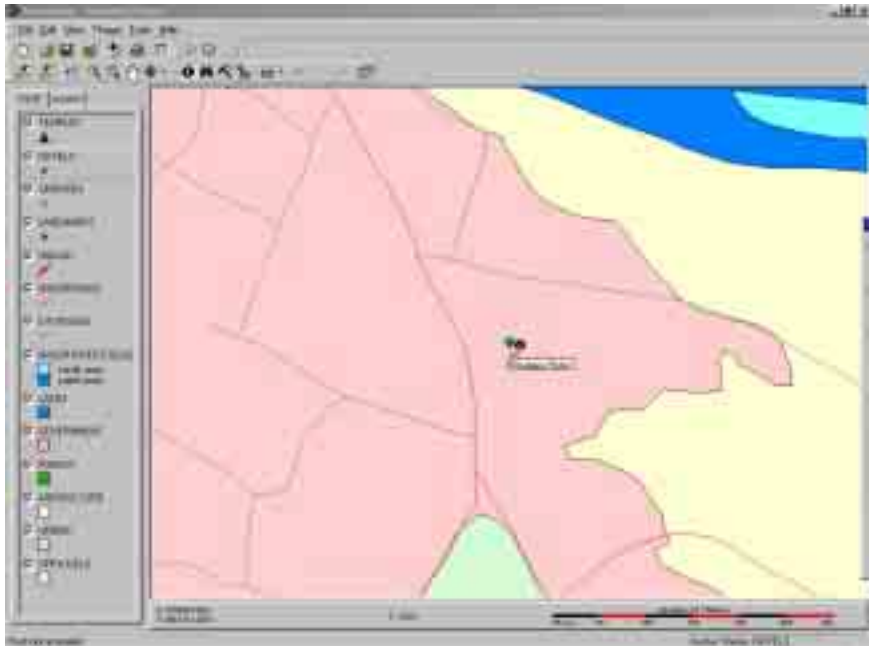
Step 7

Click the Highlight button. The point representing the Himalaya Hotel on the map will flash.



Step 8

Click the Zoom To button in the Find Features dialogue box. You are zoomed in to the Himalaya Hotel. Its location flashes and it is now in the centre of the map view.



Step 9



Click the Zoom to Full Extent button. You will see the entire map—that is the area covered by all the themes in the legend. Like all the tools you have used so far, the Find tool works with any theme. Now, you will locate the Pashupati Nath temple.

Step 10

Use the Find tool and type Pashupati as the text you want to find in the Find dialogue box.

Step 11

Choose Any Part of Field as the search type.

Step 12

This time choose the theme TEMPLES as the theme to search.

Step 13

Click the Find button.

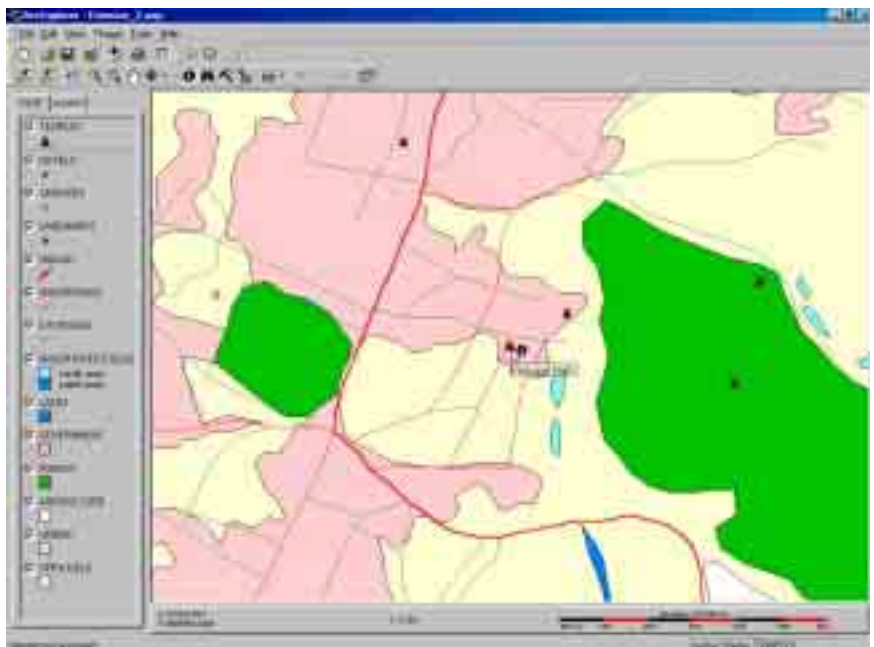
Step 14

Click on the match for Pashupati.



Step 15

Use the Highlight button to flash the location of Pashupati Nath temple. Click the Zoom To button in the Find Features dialogue box to zoom in on the temple.



Step 16

Close the Find Features dialogue box.

Self exercise: Find the location of Swayambhu Nath temple.

Exploration 4-How far is it?

Now that you have some idea about the data, you are ready to perform a real geographic analysis such as using the data to measure distances.



Step 1

Close the Find Features dialogue box.

Step 2

Activate the TEMPLES theme and click the Zoom to Active Theme button.

Finding distance is a two-step process. Firstly, you must tell the GIS about the kind of measurement units of your stored map data: decimal degrees, feet, metres. Secondly, you need to tell the GIS which kind of measurement units you want it to use to tell you the distance from one place to another, e.g. feet, metres, kilometres.

Step 3

From the View menu, select Scale Bar Properties, Map Units, Meters as shown below.



Step 4

You want to know how far Pashupati Nath is from the Himalaya Hotel. You have already located places using Find tool, so locate Himalaya Hotel and Pashupati Nath temple again (if you need to).

Step 5

Click on the Measure tool down arrow, then choose Meters from the list. These are your distance units. You can either measure distance between two points in a straight line or you can click several points along a route (at each turn) to obtain a total distance.



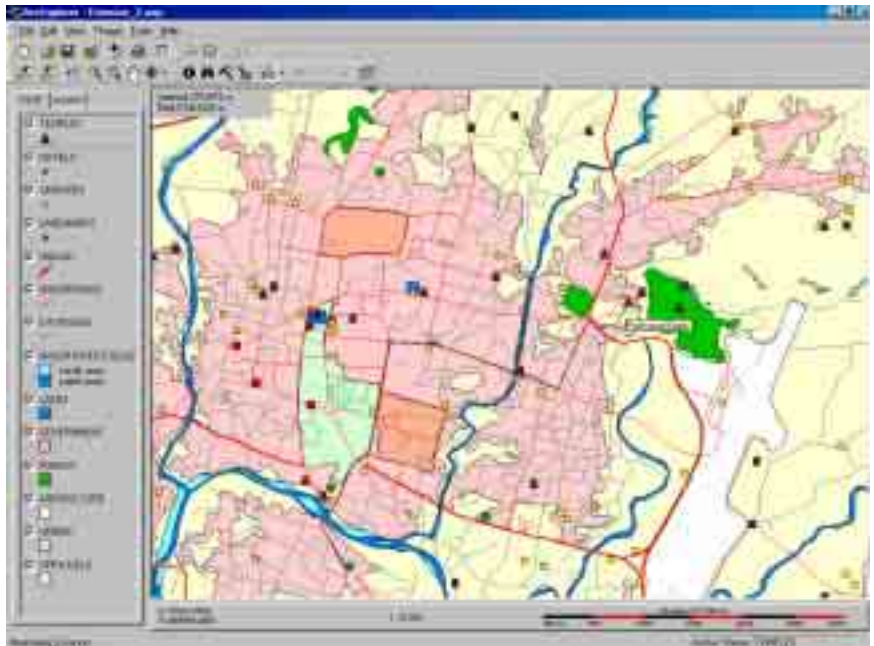
First, you will measure the distance between the Himalaya Hotel and the Pashupati Nath temple.

Step 6

Click on the Measure tool. The pointer changes to a crosshair. Since there is no straight path from the Himalaya Hotel to Pashupati Nath, you will need to measure the path in several segments. Click and hold the mouse as you drag a line segment from the Himalaya Hotel toward Pashupati Nath following the main roads and avoiding water bodies. Release the mouse button at the end of each segment. Follow the path as shown below.

Step 7

The segment and the total length you measured are displayed in the status panel at the top of the map view. The total distance is about 5738 m, i.e., 5.7 km.



If you want to re-measure the distance, double-click anywhere in your map view to begin a new measurement. After you double-click, the total length of your previous measurement appears in the lower left corner on the status bar.

Self-exercise: Find the distance from the Himalaya Hotel to Swayambhu Nath temple.

Step 8



Click the Close Project button. Choose No when asked if you want to save any changes.

Exploration 5-What's it like?

Another way of answering questions about an area is by using the Query Builder. This gives answers to queries that begin 'Where is...?'

Step 1

Start ArcExplorer, if necessary.

Step 2

Click the Open Project button. Navigate to the *GIS Basics\Exercise\Data\Kathmandu* directory.

Step 3

Select the project file called Exercise_2a.AEP and click Open. When you open the project, you see a map view of the VDCs (village development committees) around the Kathmandu and Lalitpur municipalities, with the themes VDC, MAJOR ROADS, HIGHWAYS, CITY ROADS and SCHOOLS.

In the legend, you see the name of a number of VDCs under VDC theme. You see different colours for different VDCs, and the same colour for different VDCs. While looking at the VDC names, you found one VDC name called Lokanthali and you became curious about this VDC. Where is it located? You can use the Query Builder to solve your problem.

Step 4



Make sure the VDC theme is active and click the Query Builder bottom or select Query Builder from the Tools menu.



The Query Builder dialogue box displays. At the top of the dialogue box you see the name of the active theme, VDC. The dialogue box contains a list of field names (at the left) that gives information about population and socioeconomic data for all the VDCs; a set of operators (in the centre) that will do the actual query work; and a list of sample values (at the right).



Step 5

In the Query Builder dialogue box, scroll down through the list of field names. Click on NAME (represents name of VDC). You see the values for this field displayed in the Sample Values list.

Step 6

Click the equal to (=) operator. It displays in the query text box.

Step 7

Click Lokanthali from the Sample Values list. Now, in the query text box you should read NAME = 'Lokanthali'.

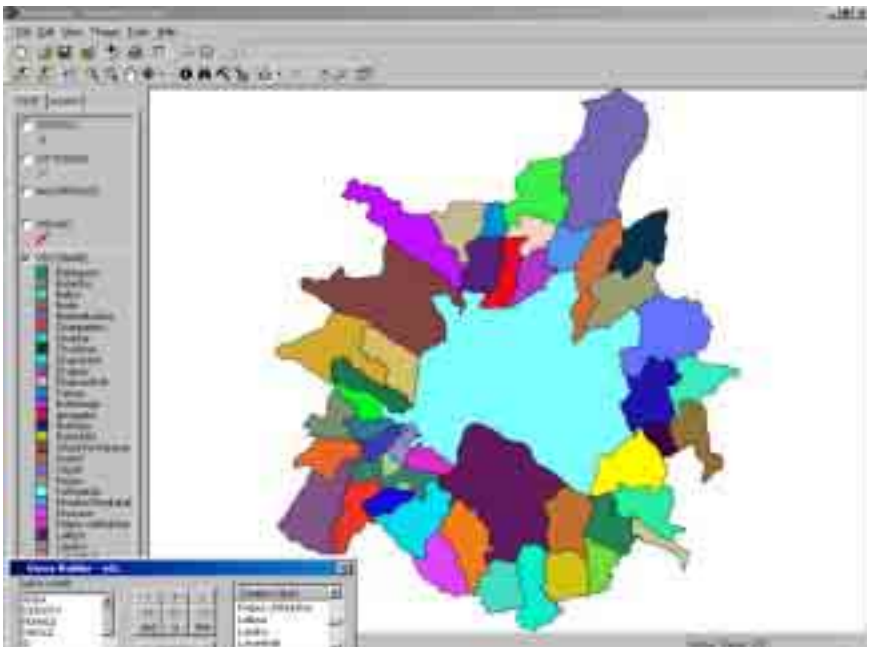


Step 8

Click the EXECUTE button. ArcExplorer searches the attribute table for all records that match your request.

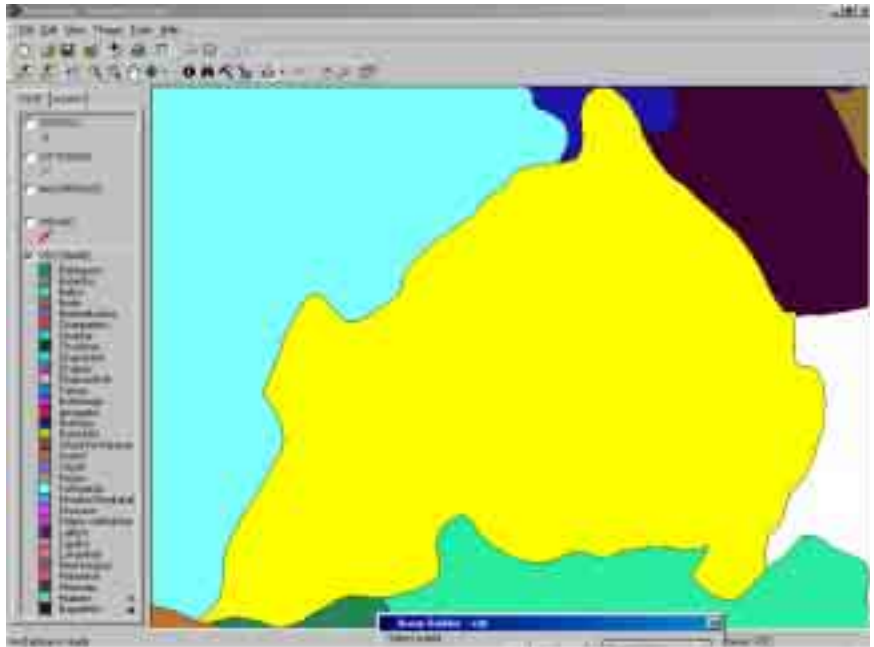
Step 9

Click the Highlight Results button. The Lokanthali VDC is highlighted in your map view in yellow. Move the dialogue window to the side so you can see your map view.



Step 10

Click the Zoom to Results button in the Query Builder dialogue box. You will see the Lokanthali VDC in detail.



Close the Query Builder dialogue box by clicking the 'x' in the top right-hand corner of the box.

Step 11

Now click on the themes SCHOOLS and CITY ROADS to obtain a general idea about the status of the roads and number of schools in Lokanthali VDC. There are only four schools and little road accessibility.

Step 12

Click off all the themes except VDC.

Step 13

Make the VDC theme active and click the Zoom to Active Theme button.

Step 14

Use the identify tool and click on any VDC. You will see stored information about that VDC. In this case, you have the information about its area, total population, male population, female population, household numbers and population density represented by the fields AREA, TPOPU, FEMALE, MALE, HHOLD and DENSITY respectively.

You can fulfil many queries using different fields. For the moment, maybe you want to know how many VDCs have a population of less than 5,000.



Step 15

Click the Query Builder button. The Query Builder dialogue box displays.

Step 16

In the Query Builder dialogue box, scroll down through the list of field names. Click on TPOPU (for total population). You can see the values for this field displayed in the Sample Values list.

Step 17

Click the less than (<) operator. It displays in the query text box.

Step 18

Type 5000 in the query text box. Now, you should read TPOPU < 5000.

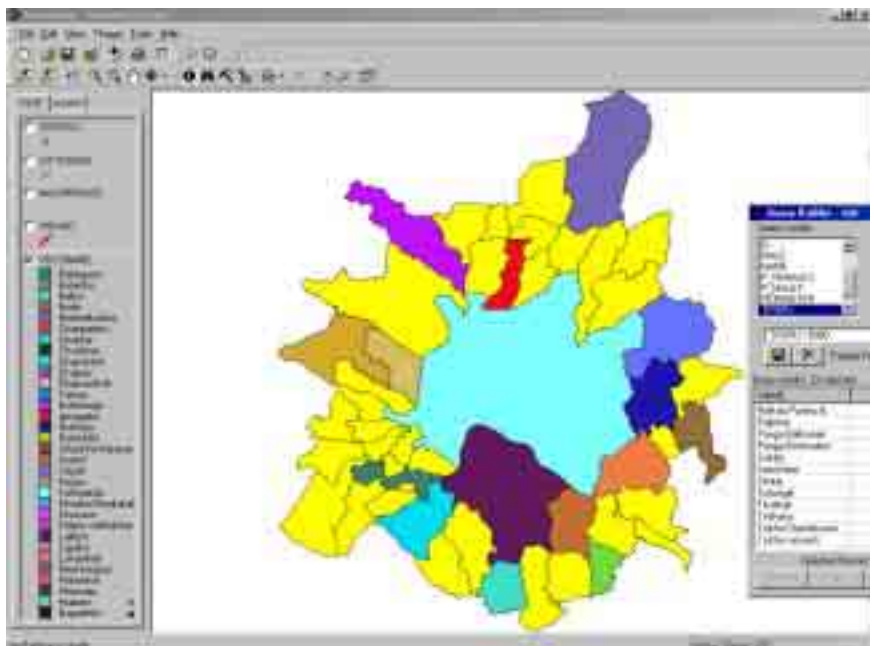
Step 19

Select NAME from the Display Field list and click the Execute button. You will see there are 33 VDCs that match your request (i.e. have a population of less than 5,000). The names of the VDCs are also listed.



Step 20

Click the Highlight Results button to see these VDCs. Move the dialogue window to the side so you can see your map view.



Step 21

When you have finished, close the Map Query dialogue box by clicking the 'x' in the upper right-hand corner.



Step 22

Click the Close Project button. Choose No when asked if you want to save any changes.