

Printing a Digital Map

Functionality of Geographic Information Systems (GIS) are endless. We can analyze large amount of spatially related data to answer our questions, or simply print out colorful maps to communicate our finding to others.

Explorer's Guide

Before You Start

With your teammates generate five questions about Nebraska you would like to find the answer. These questions can be related to population, land use, transportation, state infrastructure, etc. What data layers would you recommend to answer each of these questions?

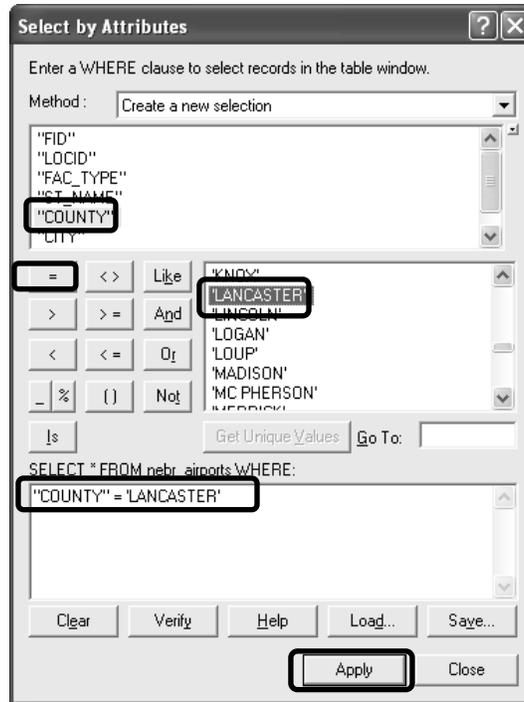
No.	Question	Needed data
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Learning by Doing

1. So far, you've been managing GIS data inside the project. Many layers of data can be added as well. For example, add the "Roads" layer (*Roads.lyr*) located in the Nebraska folder in the GIS dataset. To do this, click the add data button in the toolbar as shown below.

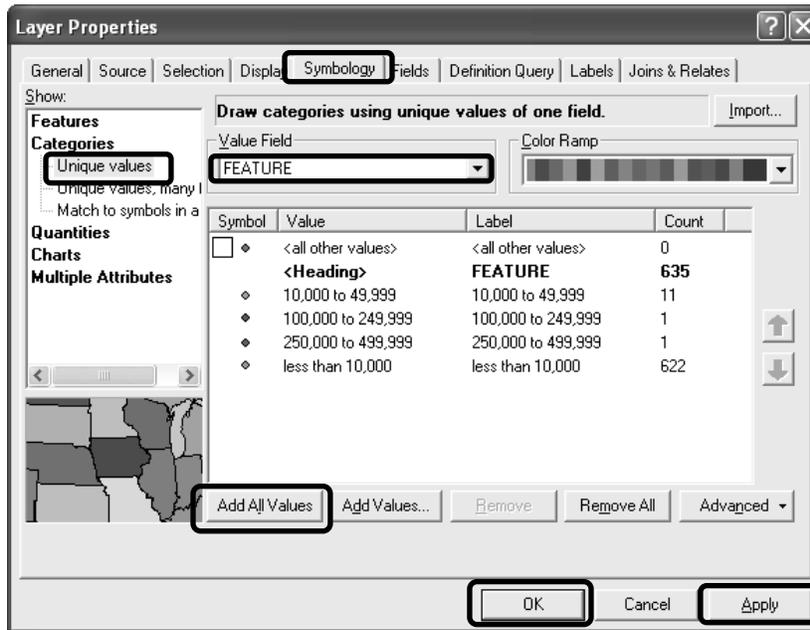


2. Let's assume that the airport authority of Lancaster County, Nebraska is trying to locate and count all of the airfields through in the county. Your task is to find all the airports and heliports in Lancaster County? To do it, go to the attribute table of *airports* layer in *Nebraska* project in *4H-GIS* folder. Click Options button located at the bottom right hand corner of the attribute table. Use Select by attributes window. Double click "county" in the method window, then click the equals sign. Click the get unique values button and double click 'Lancaster' to select features by attributes as shown below. After selecting all the airfields, count your selection.



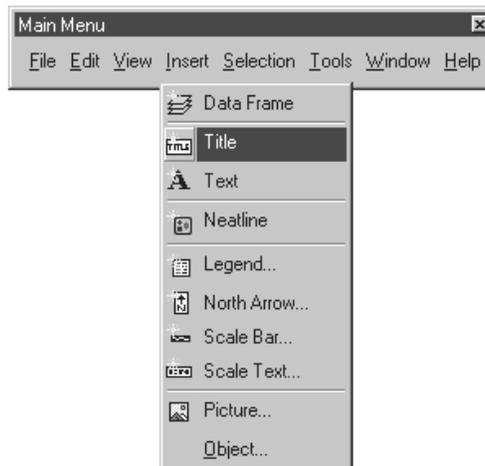
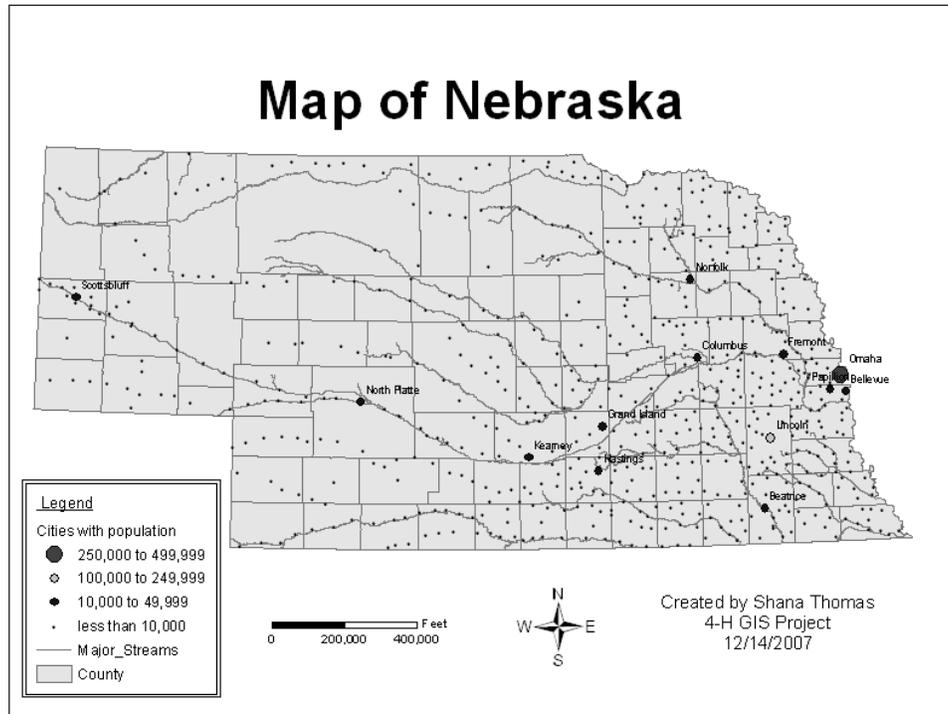
There are _____ airfields in Lancaster county of Nebraska.

- Find the Nebraska cities with the highest population using *the cities* layer. Right click the layer to reveal layer properties as shown below. Make sure *FEATURE* is selected in *Value Field*, as shown. *Add all values* and *apply* to see the resulting map. Verify your answers using the same technique as you used to count airfields.



The cities with highest population are _____ and _____.

4. Create and print out a map with cities, major streams and county layers. To do this, go to *Layout View* under *View* menu. Insert the map and major map components (Activity 13) by selecting Title, Legend, North arrow, and Scale bar from *Insert* menu. Your map should look similar to the one shown below.

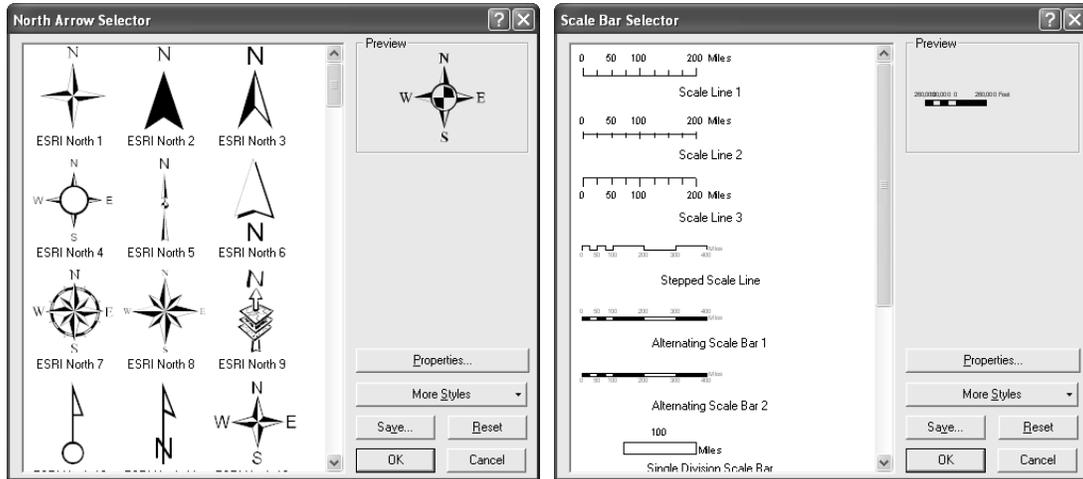


How Does It Work

Since most data layers contain spatial as well as attribute information, it is possible to analyze geographic objects according to their relative location as well as using properties of these objects. For example, we can select points that are included in a polygon or within a certain distance from a line or other points. On the other hand, we can select towns or counties according to their population or size, which may not be shown on the map right away.

When using ArcMap software, View and Layout modes are available to work with data. While View mode is used to manage data layers, Layout mode allows constructing actual maps,

including all necessary map elements (title, legend, scale, north arrow, etc.). Previewing layout enables seeing actual maps before it they are sent to a printer. There is a variety of different styles for all map elements that make each map a unique creation of art and science (see example north arrows and scale bars below).



Additional Challenge

See if you can figure out labeling. For example, label (insert names) of Nebraska cities with population greater than 10,000.

Vocabulary

Layout is an on-screen document where map elements are arranged for printing.

Legend is a reference element of the map that lists and explains the colors, symbols, line patterns, shadings and annotation used to construct the map.

Scale is the ratio or relationship between corresponding distances shown on the map and in reality.

North Arrow is a map symbol showing the orientation of the map.

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