GIS Level 1: ArcGIS Pro Workshop Exercises

Exercise 1

Open software

1. Open ArcGIS Pro on your computer. Select Map from the Blank Templates area.
2. Name your Project GIS_Level1 and select a location for saving it. A blank map will now open.

Add data

1. Click the Map tab and the Add Data button.

2. Navigate to the workshop folder and select GIS_Level1_Data\workshop_exercises.
3. Add all the data layers:
   a. MBTA_NODE
   b. MBTA_ARC
   c. cambridge_demographics
   d. cambridge_DEM
   e. cambridge_restaurants

   It may take a minute for the data to load.

Review interface & organize data

- The center of the screen contains a basemap that has been automatically loaded. It is there to provide context for the data that we added.
- You can move around the map using the pan and zoom buttons in the Map tab of the top menu bar.
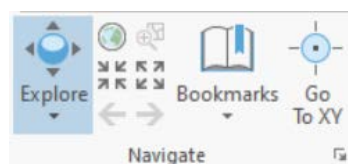
- Data layer names are shown in the Contents pane on the left. You can right click on any layer and select Zoom to Layer to center it on the screen.

1. Drag the layers up or down so that they do not cover each other.
2. You can turn layers on and off by checking/unchecking the box next to each name. Uncheck the cambridge_DEM for now so it is easier to see the other data layers (we will change its appearance later in the exercise).

Clicking the menus at the top of the screen will show various tools you can use to edit, visualize and analyze your data. The toolbox in the Analysis tab will open the full list of analysis tools, which we will explore more in GIS Level 2.

Identify types of data & explore attributes

1. Look at the data layers in the Contents pane. Are they vector or raster data? If they are vector, are they point, line or polygon?
2. To see the underlying data of each layer, right click on it and select Attribute Table.
   a. What columns are included with the MBTA_ARC data?
   b. What about the cambridge_DEM? Why are they different?
3. The cambridge_restaurants data layer is currently not in a shapefile format so it is not displaying on the map, however we can convert it to point data by plotting the coordinates included in the table.
   a. Right click on the cambridge_restaurants table in the Contents pane and select Display XY Data.
   b. Click the folder next to Output Feature Class to select a location to save the data and choose a file name.
   c. The X Field should already be filled in with Longitude and the Y field with Latitude. Keep the Coordinate System as GCS_WGS_1984.
   d. Click OK.
4. Save your map project and keep your map open.

Exercise 2

Data can be symbolized in a variety of ways, depending on the data format and available attributes.

Change a single symbol

1. Double click on the point symbol below the Cambridge_restaurants layer in the Contents pane.
2. Choose a symbol to represent the restaurants. You can make additional modifications to the symbol in the Properties tab.
3. Close the Symbol window when you are finished.

Symbolize categories

You want to change the color of the mbta lines (MBTA_ARC) so they correspond to the correct color.

1. Right click on MBTA_ARC and select Symbology.
2. Choose Unique Values under Primary symbology, which means that each value will be assigned a unique color, pattern, etc.
3. Look at the metadata (https://www.mass.gov/info-details/massgis-data-mbta-rapid-transit) to determine which column contains information about the name of the rapid transit line. Choose the appropriate column from the dropdown menu in Field 1.
4. Click the Add all Values button to add all unique values found in the LINE column.

5. Click on the line symbol in the Symbol column to select an appropriate color. Click Apply and the back arrow after selecting each color.
6. Close the Symbology window when you are finished.

Make a choropleth map

1. Select the Cambridge_demographics layer in the Contents pane by clicking on it so it is highlighted.
2. Click the Appearances menu and Symbology.
3. Select Graduated Colors from the Primary symbology dropdown menu to create a choropleth map.
4. Open the metadata for this layer outside of ArcGIS Pro. It is in the workshop_exercise data folder and called Cambridge_demographics_variable_names.txt. Choose which data you would like to symbolize and choose the corresponding column from the Field dropdown menu.
5. Experiment with different break methods, classes, and color schemes from the dropdown menus until you are happy with your map.
6. Click the Advanced symbology options tab and expand Format labels.

7. Click the Category dropdown to select the appropriate numeric display for your data and alter the number of decimal places if needed.
8. Close the symbology window when you are finished.

Symbolize a raster

1. Right click on Cambridge_DEM and select Symbology.
2. There are different options for symbolizing raster data versus vector data. The DEM is currently symbolized as Unique values which are most appropriate for values that each represent a different data category, such as land use so you should choose a different symbology. Feel free to experiment with other options from the dropdown menu:
   a. Stretch: assigns a continuous color scheme from the minimum to the maximum value of each raster cell
   b. Discrete: you choose a specific number of colors to use when symbolizing data
   c. Classify: data value are grouped into classes, similar to when creating a choropleth map.
3. When you are happy with your raster symbolization, close the Symbology window.

See the take home exercise for information on how to create a layout for printing or exporting your map.

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