**Geographic Information Science Exercise 2**

**Making Maps I:**

**Mapping GIS Data**

This exercise will further your understanding of symbolization and classification of data when creating a map. To complete the exercise will require you to use the skills and information you learned in Chapter 2, Tutorial 2, and the associated lectures.

Items to keep in mind:

1. Create a new project before beginning the exercise.
2. General location of data files will be provided (see below). You will have to determine exactly which file to use, but the folders you should be working with are identified.
3. Any questions requiring the acquisition of data online will be your responsibility to find the data and download it.
4. Any new tasks required will be described. Otherwise, the tools and techniques required to answer the questions will have been introduced in the tutorials for this lab and any prior labs.

To answer the questions, you will need to use the data in the following folders:

**mgisdata\Oregon\**

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**Part 1: Readings/lectures**

**Question 1:** For the following examples, identify whether the data is Nominal, Categorical, Ordinal, Interval or Ratio:

Gender:

How satisfied are you with your service (1=very satisfied, 5=very unsatisfied)?

Date (year):

Height:

Temperature (celsius):

Student ID numbers:

Grades (A, B, C, D):

Distance:

Elevation:

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**Part 2: Symbolization**

Use ArcGIS to create four maps showing various aspects of Oregon, as described below (use data from *oregondata* geodatabase). Use what you have learned about symbolization to make each map as aesthetic and legible as you can.

Start with a New Map for each of Questions 2-5 and create each map within the same project.

**Question 2:** Create a map showing Volcanic Hazards in Oregon with the following criteria:

1. Show the population density (2014) of the counties (**graduated color** map). Also show the hospitals, marked with blue crosses.
2. Display the volcanoes using a **proportional** symbol based on the *KNOWN\_ERUP* (Known Eruptions) field (do not include any values for unknown eruptions).
3. Examine the Contents pane. Make sure you use appropriate labels, good classification schemes, rounded label values, and appropriate significant digits or decimal places where appropriate.
4. **Capture** the map and contents pane. Make sure the relevant features are visible in the contents pane. Insert image here.

**Question 3:** Create a map showing agriculture patterns in Oregon with the following criteria:

* 1. Show the density of farms (*No\_Farms12*) in each county (**graduated color** map). Be sure to normalize the data. Identify what the data is normalized by.
  2. Label the county names.
  3. Include the transportation routes/features, symbolized by type (highways, rail, airports).

1. Examine the Contents pane. Make sure you use appropriate labels, good classification schemes, rounded label values, and appropriate significant digits or decimal places where appropriate.
2. **Capture** the map and contents pane. Make sure the relevant features are visible in the contents pane. Insert image here.

**Question 4:** Create a map showing housing patterns in Oregon with the following criteria:

1. Show the housing vacancy (*vacant*) rate of counties (**graduated color** map). Be sure to normalize the data. Identify what the data is normalized by.
2. Label the county names
3. Show the major cities (*majcities*) symbolized by population class (graduated symbol).
4. Examine the Contents pane. Make sure you use appropriate labels, good classification schemes, rounded label values, and appropriate significant digits or decimal places where appropriate.
5. **Capture** the map and contents pane. Make sure the relevant features are visible in the contents pane. Insert image here.

**Question 5:** Create a map showing the physiography of Oregon with the following criteria:

1. Add the state boundary (*statedtl*) and the county boundaries
2. Add the Imagery basemap
3. Use a hollow symbol and a contrasting outline color for the state and county boundaries so that you can see them against the imagery (use different colors for state and county boundaries).
4. Examine the Contents pane. Make sure you use appropriate labels, good classification schemes, rounded label values, and appropriate significant digits or decimal places where appropriate.
5. **Capture** the map and contents pane. Make sure the relevant features are visible in the contents pane. Insert image here.

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**Part 3: Data classification**

Use ArcGIS to demonstrate the impact of different classification styles for the same set of data (use data from the *oregondata* geodatabase).

Start with a New Map for each of Questions 6-9 and create each map within the same project using the following criteria.

1. Add the county level data for Oregon.
2. Select any variable from the county dataset (excluding those used in the questions above). Use the same variable for each map below.
3. In each map display the same data (**graduated color** map) according to the classification scheme listed for that map.
4. Use the same number of classes for each map.
5. Use the same color palette for each map.
6. Select appropriate classification parameters for each map (number of classes, normalization [if required], rounded label values, and appropriate significant digits or decimal places where appropriate).

**Question 6:** Create a map using a Jenks (Natural Breaks) classification.

1. **Capture** the map and contents pane. Make sure the relevant features (including classes) are visible in the contents pane. Insert image here.

**Question 7:** Create a map using an Equal Interval classification.

1. **Capture** the map and contents pane. Make sure the relevant features (including classes) are visible in the contents pane. Insert image here.

**Question 8:** Create a map using a Quantile classification.

1. **Capture** the map and contents pane. Make sure the relevant features (including classes) are visible in the contents pane. Insert image here.

**Question 9:** Create a map using a Standard Deviation classification.

1. **Capture** the map and contents pane. Make sure the relevant features (including classes) are visible in the contents pane. Insert image here.

**Question 10:** Look at the four maps you created for Questions 6-9. Which classification scheme do you think is the most helpful in understanding the data? Why? Which classification do you think is the least helpful/most confusing and why?

**Deliverables:**

* This answer sheet (Saved as either a Word doc or a PDF)
* Screen captures (embedded in the answer sheet):
  + **Question 2**
  + **Question 3**
  + **Question 4**
  + **Question 5**
  + **Question 6**
  + **Question 7**
  + **Question 8**
  + **Question 9**