Elizabeth Fabio
BDA-594

Web Exercise 8: Topic Model and Video

1. What is the URL of your shared page in Insights for ArcGIS? (2 point).

   ArcGIS Insights Page URL:
   https://insights.arcgis.com/#/view/fe592b49968b40a2bfa6b94c2d3b032d

2. In the Insights Analysis Capability web page, select two examples of Map types and two examples of Chart types and explain their functions and give one example for each type. (8 points: 2 points for each type and the example).

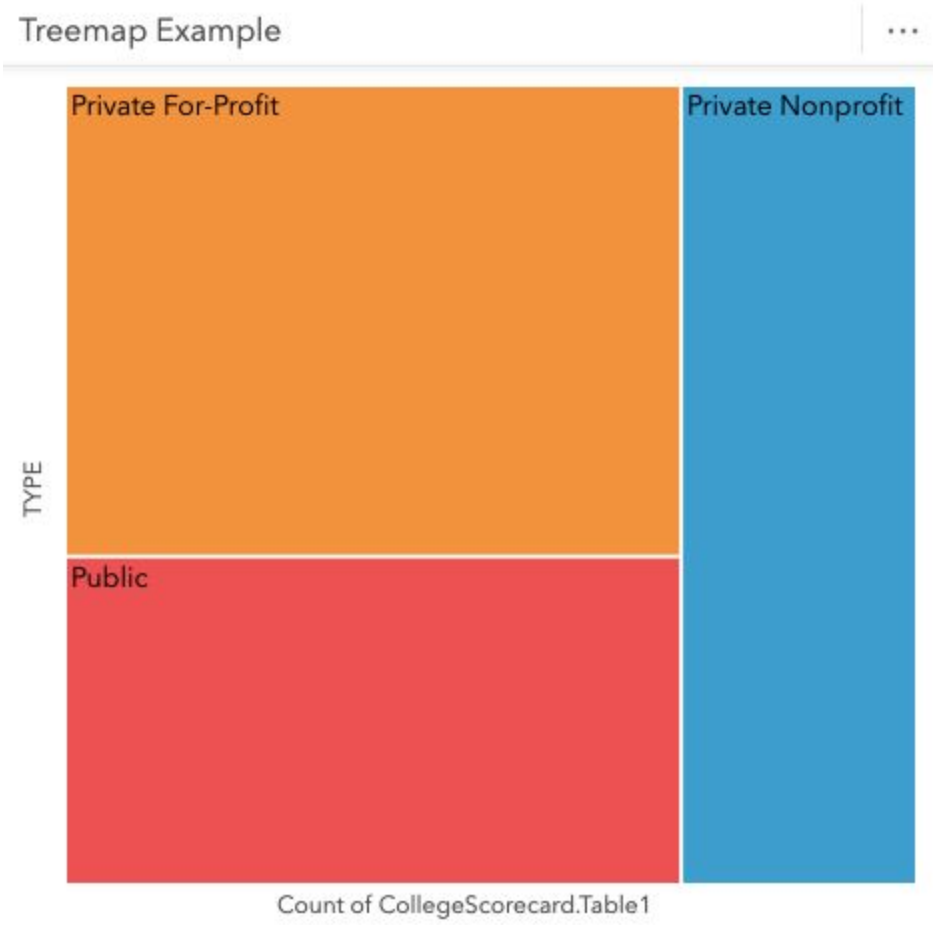
   Two Example of Map Types:
   - Choropleth Map: This map visualizes the counts and amounts of an area with differences in color or shading. Specifically, it involves classifying data at different ranges that represents a shade or color on a color ramp. These ranges should be proportional to reduce bias. Data classification options that are available include: natural breaks, equal interval, quantile, standard deviation, unclass, and manual. In the case of our "Percent of colleges with above average ROI" card map, we manually adjusted the categorization to be a 10% range for each color/shading until near the max percent (73%) where it was categorized at a range of 70-73%.
     - Example: Apply a choropleth map over the population of each California county. For data classification, applying a standard deviation method may be a better visualization. You would be able to observe if one county is above or under the mean county population. Applying a divulging color ramp can help aid this visualization too. For instance, Los Angeles County (Pop: 3.99 million) would have an area leaning towards dark blue to show it is above the mean county population. As for Alpine County (Pop: 1,101), it would lean towards dark red to show it is below the mean county population.
   - Binned Map: Binned maps are a good visualization for datasets with a large number of points or densely located points. Each bin can aggregate these points and be applied with statistical functions, such as sum or average.
     - Example: For our group project, we used binned maps to observe wildfire trends in 1-year increments across southern California. The statistical function used was a space-time application called the Getis-Ord Gi* statistic. The statistical function located which bin values differ from the average and whether really high or really low clusters are occurring together in a nonrandom fashion.

   Two Examples of Chart Types:
   - Treemap: You are able to view data in a hierarchical format using nested rectangles. The size of these rectangles convey numeric values for each branch. The color represents the different categories of rectangles. Two different types of

treemaps can be created in ArcGIS Insights: spatial treemaps and nonspatial treemaps. Spatial treemaps are displayed the same way as a standard, non-spatial treemap, but it's arranged based on geographic location.

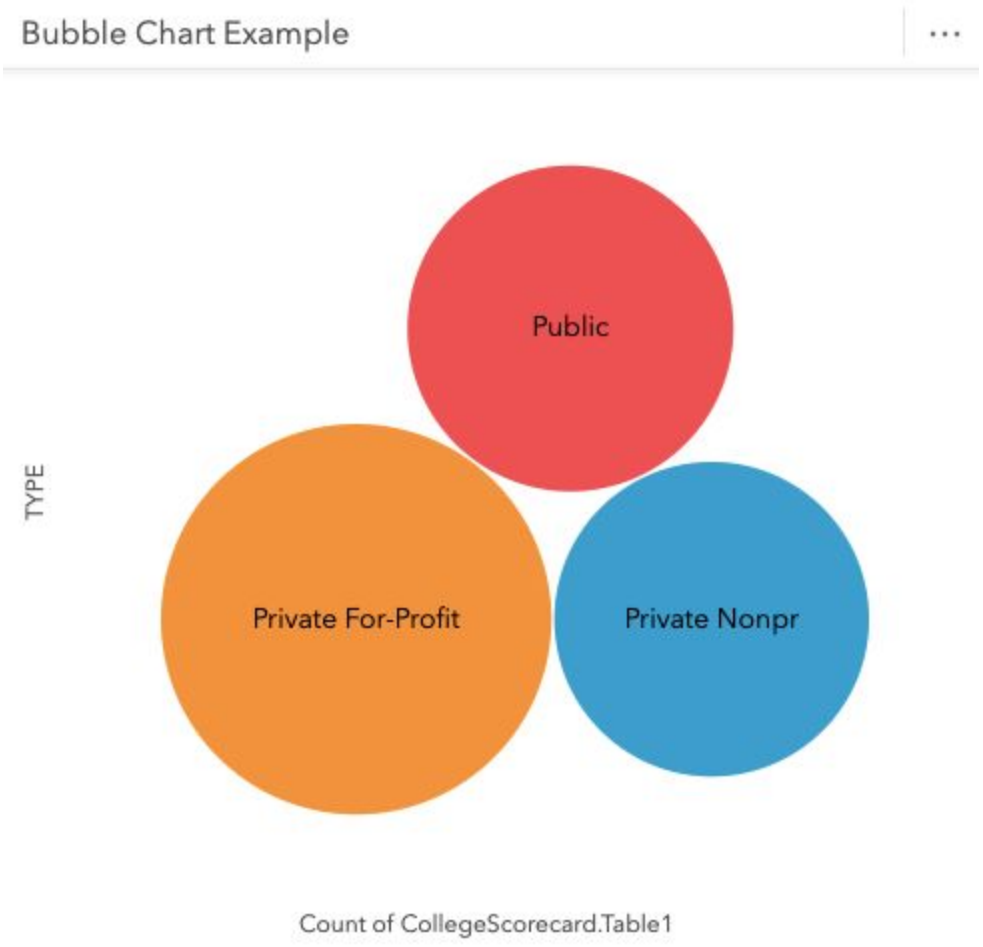
- Example: From our US Colleges ArcGIS Insights page, we can create a nonspatial treemap to analyze the different college types (Private For-Profit, Private Nonprofit, Public). The biggest rectangle being the Private For-Profit Type then Public and, then lastly, Private Non-Profit as the smallest rectangle.

Treemap_Example.png:



- Bubble Chart: This chart shows how categorical data (visualized as bubble shapes) is related. Each bubble can represent either a count, a sum, or a ratio based on its size.
  - Example: From our US Colleges ArcGIS Insights page, we can create a bubble chart to analyze the different college types (Private For-Profit, Private Nonprofit, Public). The size of the bubbles would reflect the count of each college type similar to a treemap.

Bubble_Chart_Example.png:



3. In the Insights for ArcGIS document website: https://doc.arcgis.com/en/insights/create/kpi-chart.htm. Please find out what is a KPI card and explain the method with one example. (2 point).

   A Key Performance Indicator (KPI) card evaluates the status of a measure by comparing key indicators to a target. It is helpful in measuring how close your indicator value is to the target value. KPI can be displayed either as numerical value or a gauge layout. Using the US Colleges ArcGIS Insights page, we can create a KPI gauge using the Average Earnings as the indicator and the Average Cost as the target. This shows that the average earnings of newly graduated college students ($36,092) is higher than their average college cost ($23,596). If the Average Earnings becomes lower than the Average Cost, then this can indicate a problem with the US education system or the US economy.

KPI_Example.png:

4. What are the major differences between Tableau and Insights for ArcGIS? (2 points).

The biggest difference between Tableau and ArcGIS Insights is that Tableau has more functionality for customizations (e.g. color, size, labeling, etc.) while ArcGIS Insights is more simplistic, thus can be more intuitive to use. For example, after creating a choropleth map of the average percent of adult obesity in each US state, creating a bar chart to highlight these averages per state took more time and steps to do so. First you would need to drag the “Adult Obesity (% of pop)” values from the Table section to Columns and move “State” from the Table section to Rows. Afterwards, you would need to select “Adult Obesity (% of pop)”, click the down arrow button next to it for the menu, and select Measure > Average. As for ArcGIS Insights, you would only select “Adult Obesity (% of pop)” and “State” from the left-hand menu and drag your selection to the page. Make sure to drag to “Chart” and then further drag to “Bar Chart”. Afterwards, select “Average” from the drop-down menu under the x-axis.

Also another big difference between Tableau and ArcGIS Insights is the variety of map types you can create (not referring to chart types). In Tableau, you are only able to create maps similar to a choropleth map and a symbol map. While in ArcGIS Insights you can create the mentioned maps and more, like binned maps and heat maps.

5. What is ArcGIS Pro? (provide a brief overview with 100 words) (2 points)

   ArcGIS Pro is a desktop GIS application where you are creating and working with spatial data (2D maps and 3D scenes). A distinguishing difference between ArcGIS Pro and ArcGIS Desktop, since they are both desktop applications, is that ArcGIS Pro integrates more with ArcGIS Online. With ArcGIS Pro, you are able to share your work easily through ArcGIS Online. ArcGIS Pro is also a ribbon-based application. This means many commands are available on a horizontal ribbon at the top of the application window as functional tabs. Other components of ArcGIS Pro include view windows and panes. View windows are used for working with different data visualizations such as maps and charts. Panes offer functionality that is more advanced or complete than ribbon commands. For example, a Contents pane displays the contents of a view window.

6. What is ArcGIS API for Python? (provide a brief overview with 100 words) (2 points)

   ArcGIS API for Python is both a Python library and an API. Essentially, it is a Python API that manages Web GIS via the ArcGIS REST API. To break it down an API (Application Programming Interface) is a computing interface that allows two applications to interact with each other. REST (Representational State Transfer) is an architectural style that defines constraints to be used for creating Web services. Thus, ArcGIS REST API is a set of operations an application can perform services on to the ArcGIS Server sites. These applications can be from any of your favorite Python IDEs (Integrated Development Environment) such as Jupyter Notebooks. In summary, ArcGIS API for Python helps manage your content and users in your Web GIS using Python scripts.

7. Can you explain why some results from the ArcGIS for Python exercise might be different from the tutorial website? (2 points)

   Some of the results from the ArcGIS for Python exercise is different from the tutorial site because searching for layers is sorted by relevance and the code performs a new search each time you execute it. Thus, the website tutorial must have been created in 2017 since the year of those searched layers are from 2017. So if I execute this search code again in a year, the resulting layers will change. It may vary based on which layers are available publicly.