

Title: Basic Spatial Statistics

Critical Resources: an internet connected computer, ArcGIS Pro, week 3 overview video available on myCourses.

Purpose:

The purpose of this lab will be for you gain experience and knowledge with (a) forming a spatial hypothesis, (b) acquiring datasets to test your hypothesis with spatial analysis , (c) curating datasets to prepare your spatial analysis, (d) conducting a basic spatial analysis using GIS tools, (e) presenting results of your analysis.

Learning Objectives – After completing the lab, you will know:

- how to form a hypothesis about a spatial problem
- how to execute a basic table join
- how to execute spatial SQL queries
- testing the hypothesis using a spatial statistic
- visualizing results of your spatial analysis

Deliverables:

A write-up of your response to the instruction questions. Upload your write-up to the lab 2 drop box on myCourses.

Steps:

1. Define a hypothesis about a spatially-oriented situation that could be investigated using US census tract data at the county level. Representative example include:

Poverty rates are clustered in urban areas of Monroe County NY.
Median incomes are higher in suburban areas Monroe County NY.

Note: You cannot use these examples – you must come up with your own hypothesis/case study.

For ideas, see: <https://www.census.gov/about/index.html> for topics covered by the US Census.

2. Download the census tracts for your case study from:

<https://www2.census.gov/geo/tiger/TIGER2019/TRACT/>

See: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/?cid=nrcs143_013696 for finding a specific state for example, New York is 36.

3. Project the census tracts into a coordinate system of your case study- this will help later with calculating distances.
4. Acquire relevant indicator datasets for your hypothesis case study from:

<https://data.census.gov/cedsci/>
5. Curate the indicator dataset you download in step 3 so it can be joined onto the census tracts you downloaded in step 2.
6. Run a query to select only census tracts from your case study county.
7. Export the selected census tracts to a new feature class.
8. Create a new field in the exported census tracts feature class and populate the field's values using field calculator so the new field can be used to join with the indicator datasets
9. Join the indicator dataset you modified in step 5 onto the census tracts you downloaded in step 2.
10. Export joined dataset to a new feature class. You should now have a dataset that only has records for your case study county.
11. Test your hypothesis using a global and local statistics, see:

Global: <https://pro.arcgis.com/en/pro-app/tool-reference/spatial-statistics/spatial-autocorrelation.htm>

Local: <https://pro.arcgis.com/en/pro-app/tool-reference/spatial-statistics/cluster-and-outlier-analysis-anselin-local-moran-s.htm>

Note: you are welcome to use other spatial analytic tools if you like in addition to these two.

You are welcome to revise your hypothesis/investigation once you begin your analysis.

12. Create a basic map showing the results of your analysis from step 11.

Deliverable:

Provide a short (75-100 word) discussion if you think you can accept/reject your hypothesis and any other observations you made based on the global and local (or other) statistics you used. Include the HTML report from global statistic HTML report from step 11 and the map you made in step 12 to support your discussion. Submit your write-up to the lab 2 dropbox on myCourses. I do not need to see your datasets or project files, just your write-up.