

# Quantitative Geography

In this lab you will work with area spatial patterns and calculate various measures of spatial autocorrelation with R. You will be working with external/lux.shp an example shapefile of the Cantons of Luxemburg, which comes loaded with the raster package.

Read and follow along with the Spatial influence for polygons subsection, and then all of the Spatial Autocorrelation chapter, and respond to the questions below.

## 1. Spatial influence for polygons

[[http://rspatial.org/analysis/rst/2-scale\\_distance.html#spatial-influence-for-polygons](http://rspatial.org/analysis/rst/2-scale_distance.html#spatial-influence-for-polygons)]

- a) When you create the matrix from the neighbors list [wm <- nb2mat(wr, style='B', zero.policy = TRUE)] what coding scheme is indicated by style 'B'?
- b) And for the other styles?

## 2. Spatial Autocorrelation >> Adjacent polygons

[<http://rspatial.org/analysis/rst/3-spauto.html#adjacent-polygons>]

- a) [Question 1 in the text] Explain the meaning of the first 5 lines returned by str(w)

## 3. Spatial Autocorrelation >> Moran's i

[<http://rspatial.org/analysis/rst/3-spauto.html#compute-moran-s-i>]

In this section you will work through a lot of the calculations 'by hand' before being introduced to the package function. Don't get bogged down in the details, the point here is to help you understand the general process before it is obscured in the function.

- a) plot the density curve for the Moran's i p-value Monte Carlo calculation.
- b) [Question 2 in the text] How do you interpret the significance tests?
- c) [var Question 4 in text] Use the geary, gear.test, and geary.mc functions to compute Geary's C, and conduct significance tests.

## Deliverable

Hand in the results as a R Markdown file, include both the source file and HTML file. You can complete the .Rmd file available on Canvas.

## Due

Monday, May 8, by 9a