Lab 08: Spatial Autocorrelation

**Due date:** Friday, April 25, 2025, submitted as Word document to Canvas ***Lab08*** link.

This lab counts 12 % toward your total grade.

**Objectives:** In this lab, you will practice your skills in

1. Understand the global spatial autocorrelation
2. Spatial weight matrix
3. Local spatial autocorrelation
4. Local Indicators of Spatial Association

**Format of answer:** Submit your answers as a **Word document** with graphs and verbal descriptions, properly labeled in the task sequence, with answers in red text and only relevant content included. **For each task, please provide R code, and screenshots of the result.**

# Task 1: Global Moran’s I (6 pts)

Using the [Columbus dataset](https://www.rdocumentation.org/packages/spdep/versions/0.6-9/topics/columbus) in **spdep** package, perform a global spatial autocorrelation analysis on the housing values (HOVAL) variable using **queen contiguity weights**.

1. Plot the distribution of HOVAL in Columbus data over space. (2 pts)
2. Calculate Moran's I and interpret the results. (2 pts)
3. Create a Moran scatterplot and explain how the pattern in the scatterplot aligns with the conclusion in b). (2 pts)

# Task 2. Local Spatial Autocorrelation (6 pts)

Perform local spatial autocorrelation analysis on the housing values (HOVAL) variable using **queen contiguity weights**.

1. Plot and describe the spatial pattern of the Local Moran’s I values. (3 pts)
2. Plot and describe the spatial pattern of the statistical significance (p-values) of the Local Moran’s I. (3 pts)