School of Geography and Earth Sciences McMaster University

Applied Spatial Statistics

The Potential of Spatial Data (and some caveats)

Spatial vs. Aspatial Data

- How are spatial and aspatial data different?

Aspatial Data: Examples

- Salary of professional baseball players
- Concrete’s strength tests
- Development of new drugs

Spatial Data: Examples

- Location of bank branches
- Groundwater pressure measurements
- Population density

Analysis of Spatial Data

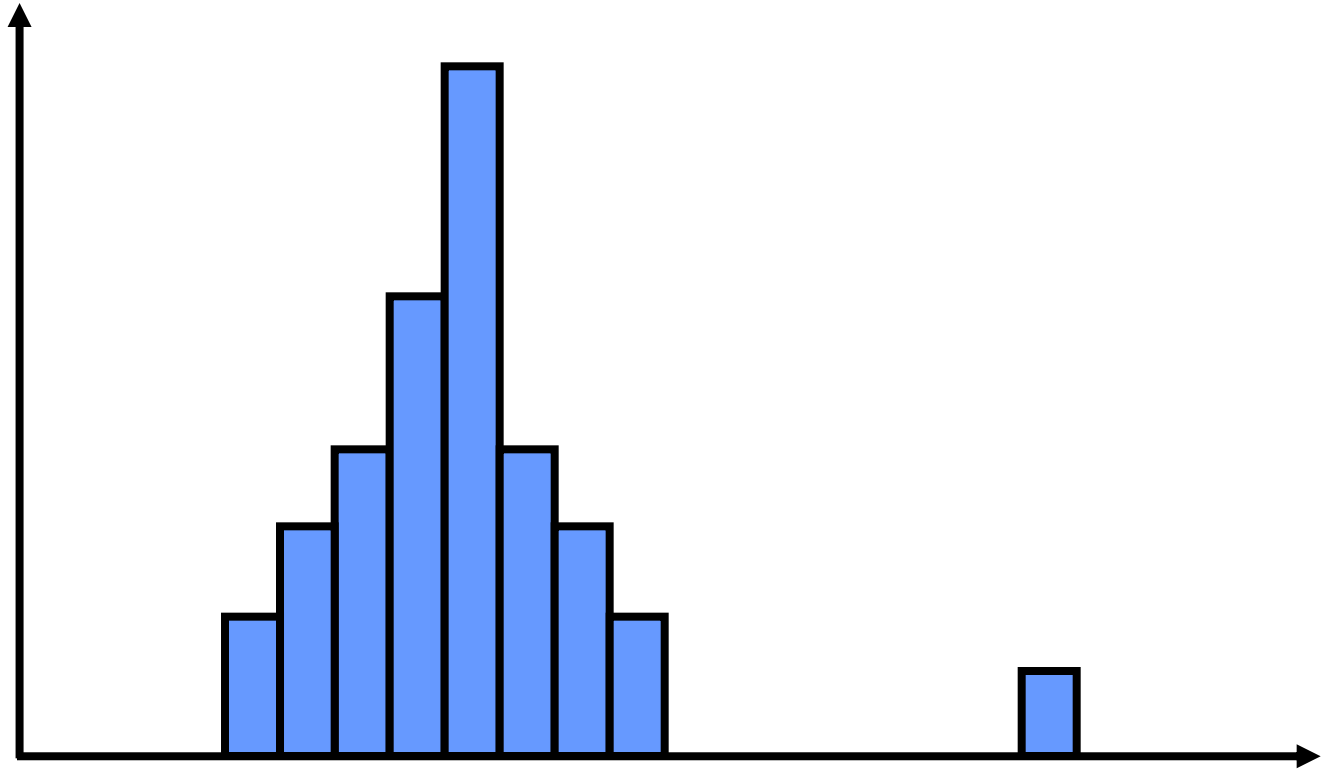
- Opportunities for inquiry and discovery
  - Location is an attribute
  - Relations in two dimensions
  - Types of spatial relations?

Analysis of Spatial Data

- Essential from a statistical viewpoint
  - Need for **robust**, **sufficient** methods

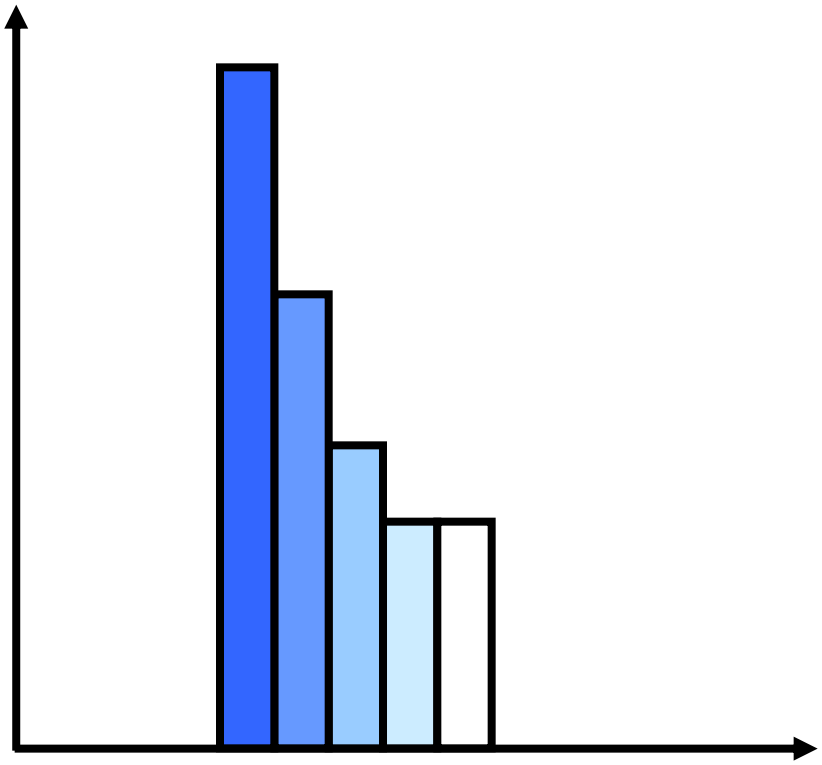
Analysis of Spatial Data

- What is a robust method?



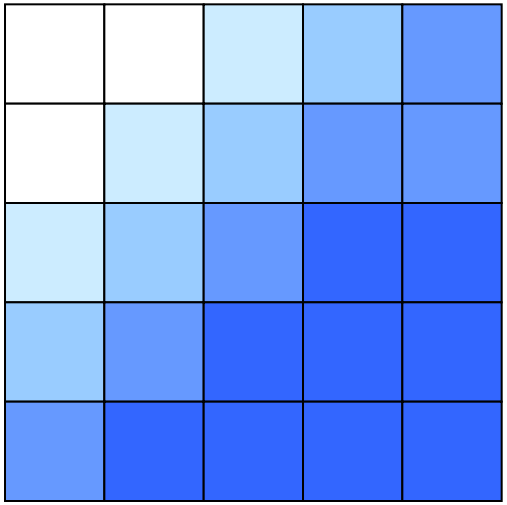
Analysis of Spatial Data

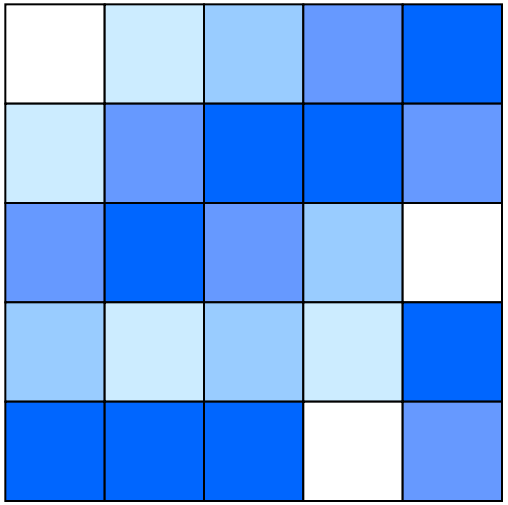
- Sufficiency criterion



Analysis of Spatial Data

- Sufficiency criterion



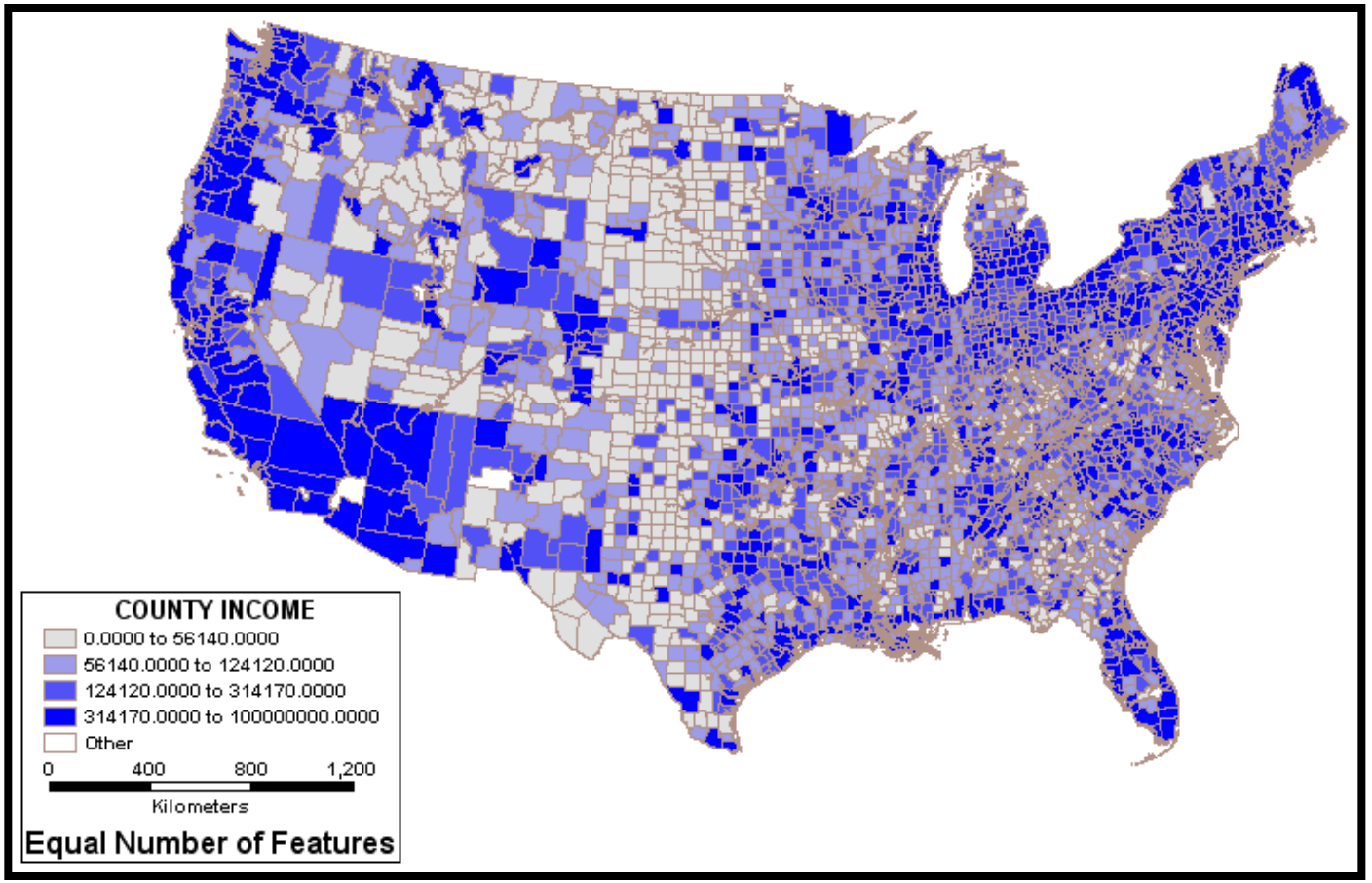


Spatial Data Analysis

- Caveats

How to Lie with Maps

- County income in the US



How to Lie with Maps

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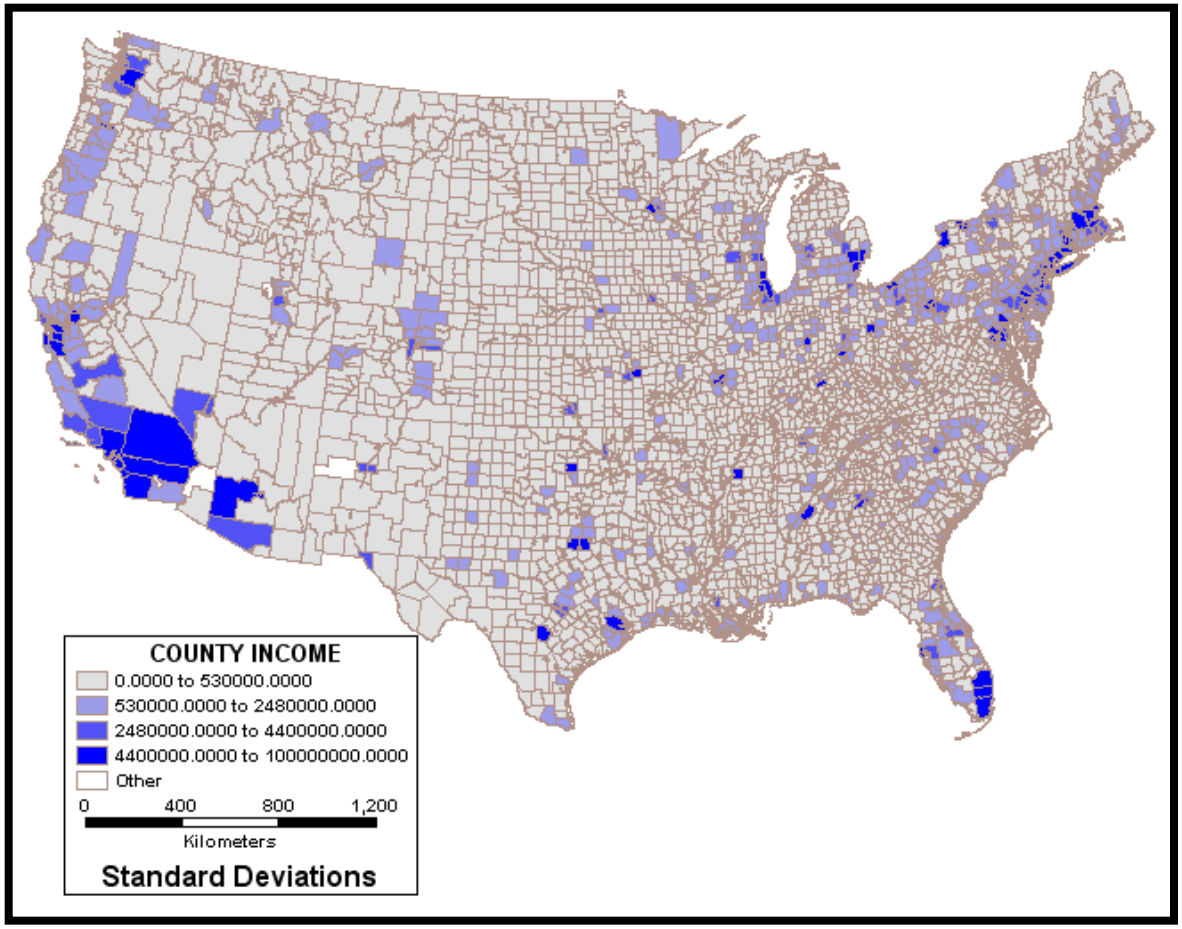
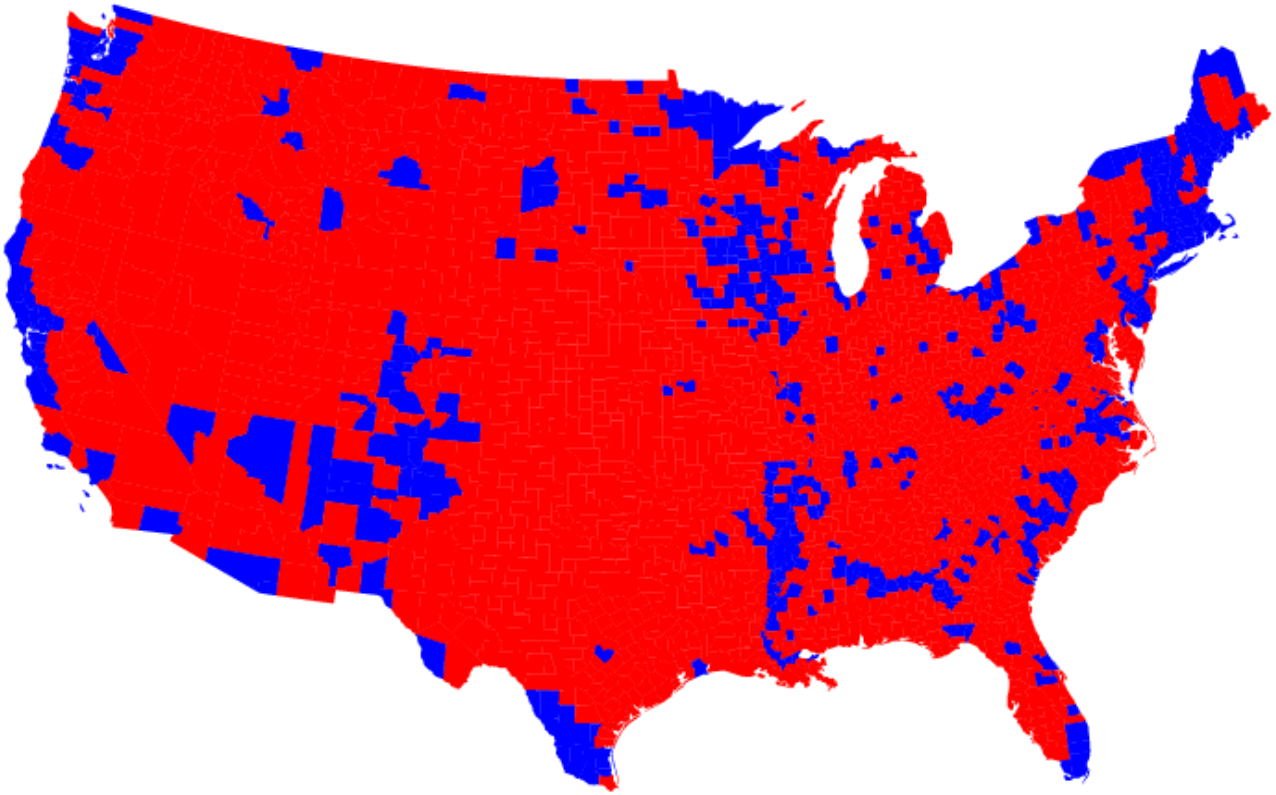


How to Lie with Maps

- US 2004 Election results



How to Lie with Maps

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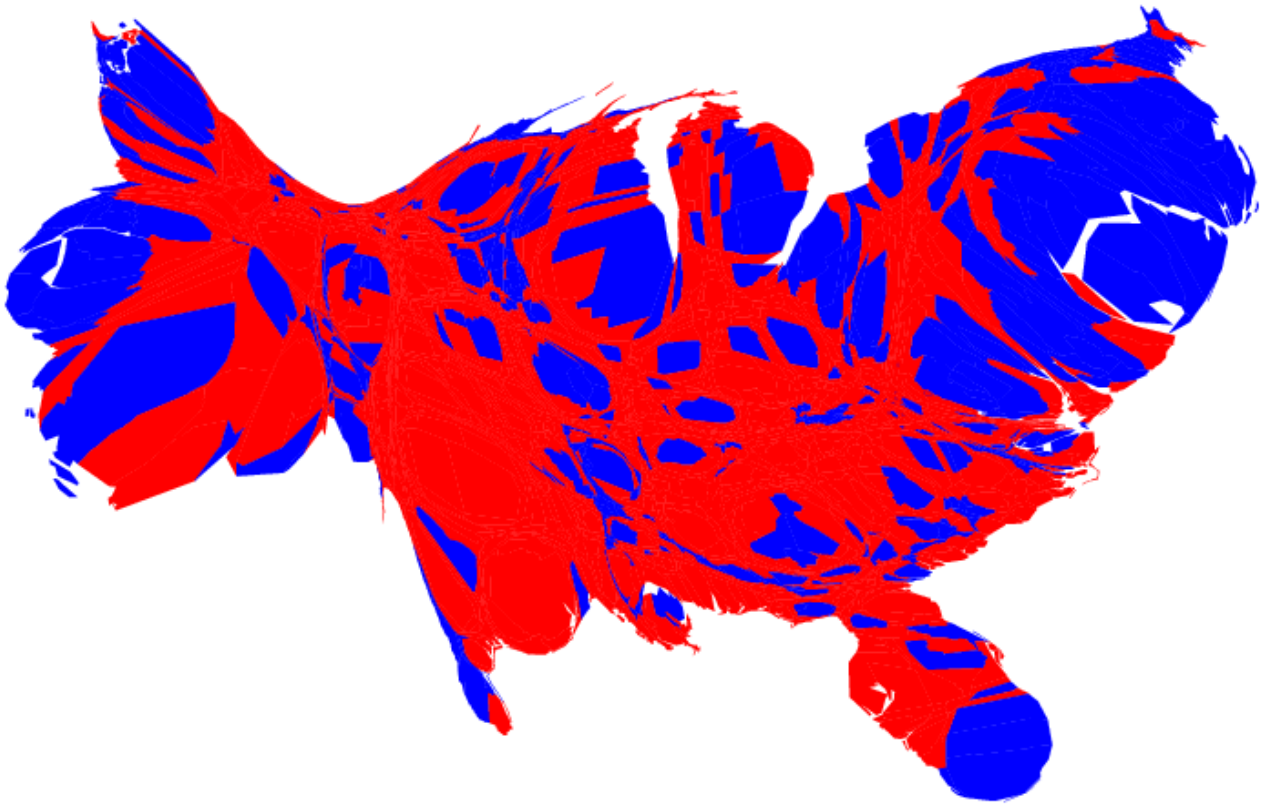
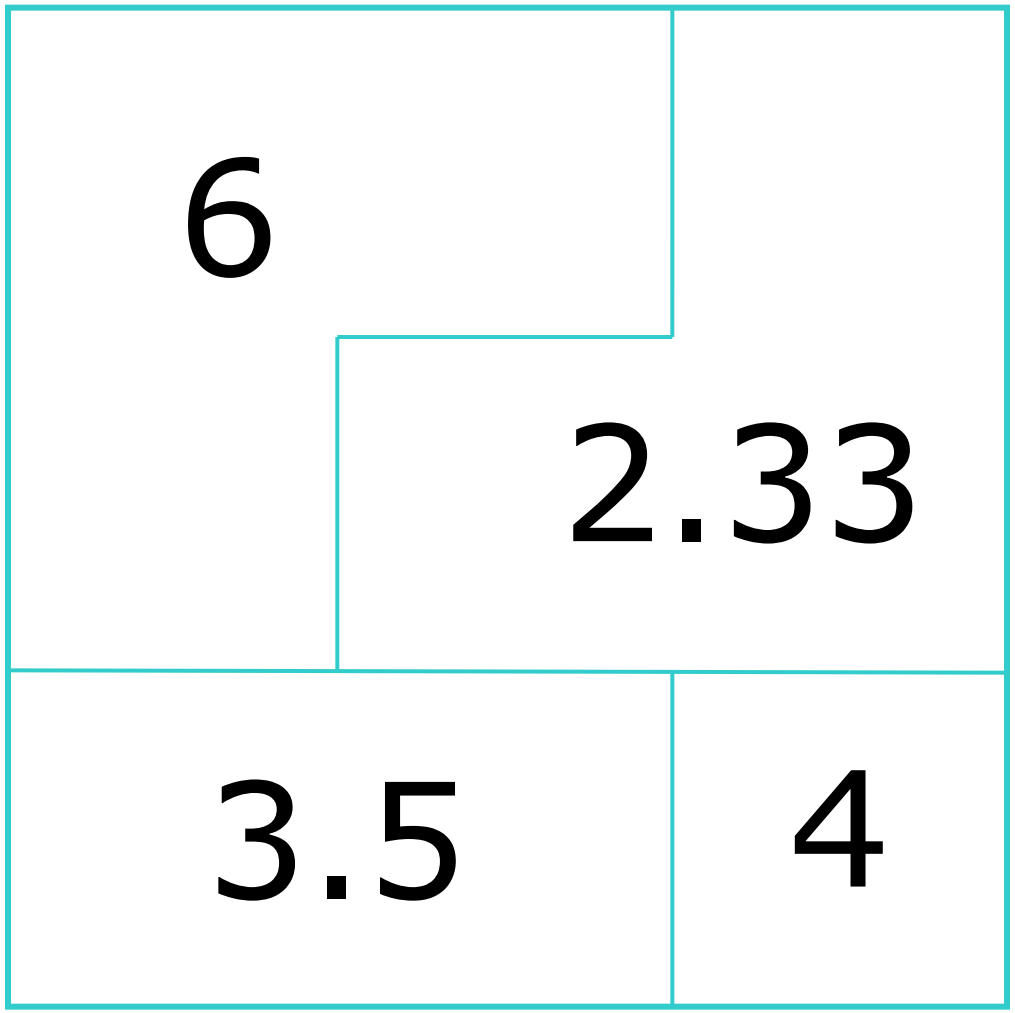


Modifiable Areal Unit Problem (MAUP)

5	6	3
7	2	2
2	5	4

$$\bar{Y} = 4$$

Modifiable Areal Unit Problem (MAUP)



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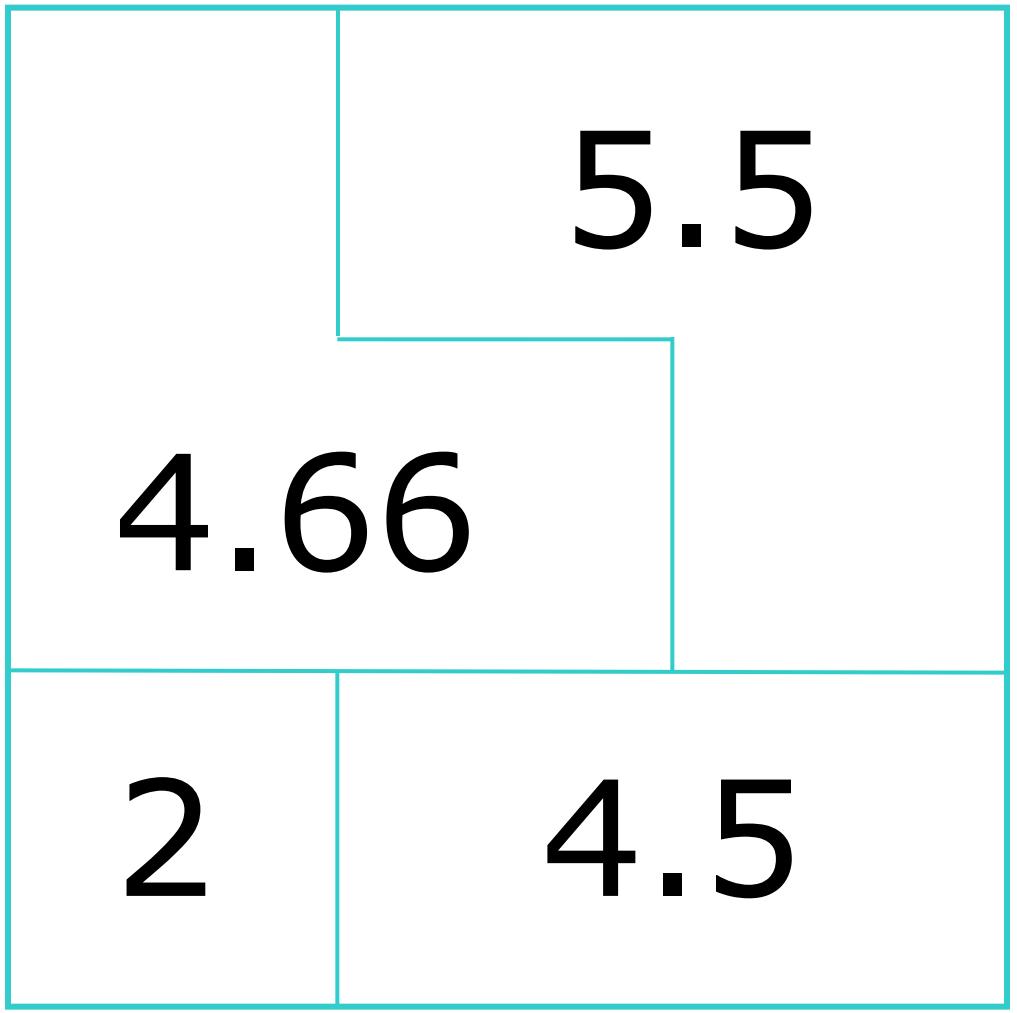
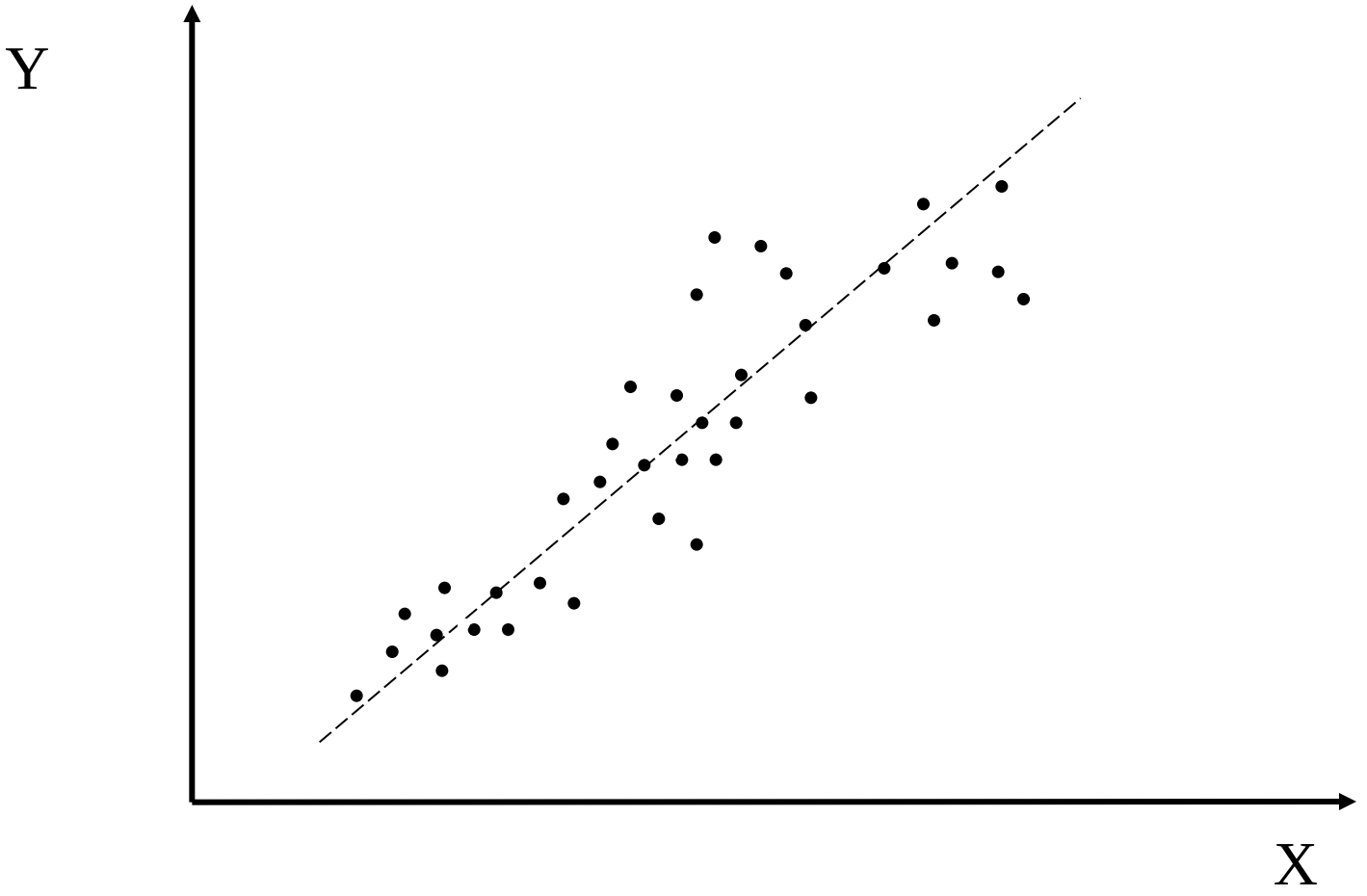


MAUP and Correlation



MAUP and Correlation

"A million or so correlation coefficients"

Stan Openshaw

MAUP

- Patterns are specific to zoning system
- If zoning system changes, results cannot be generalized

Next

- Point pattern analysis I