GIST 4302/5302: Spatial Analysis and Modeling

Review

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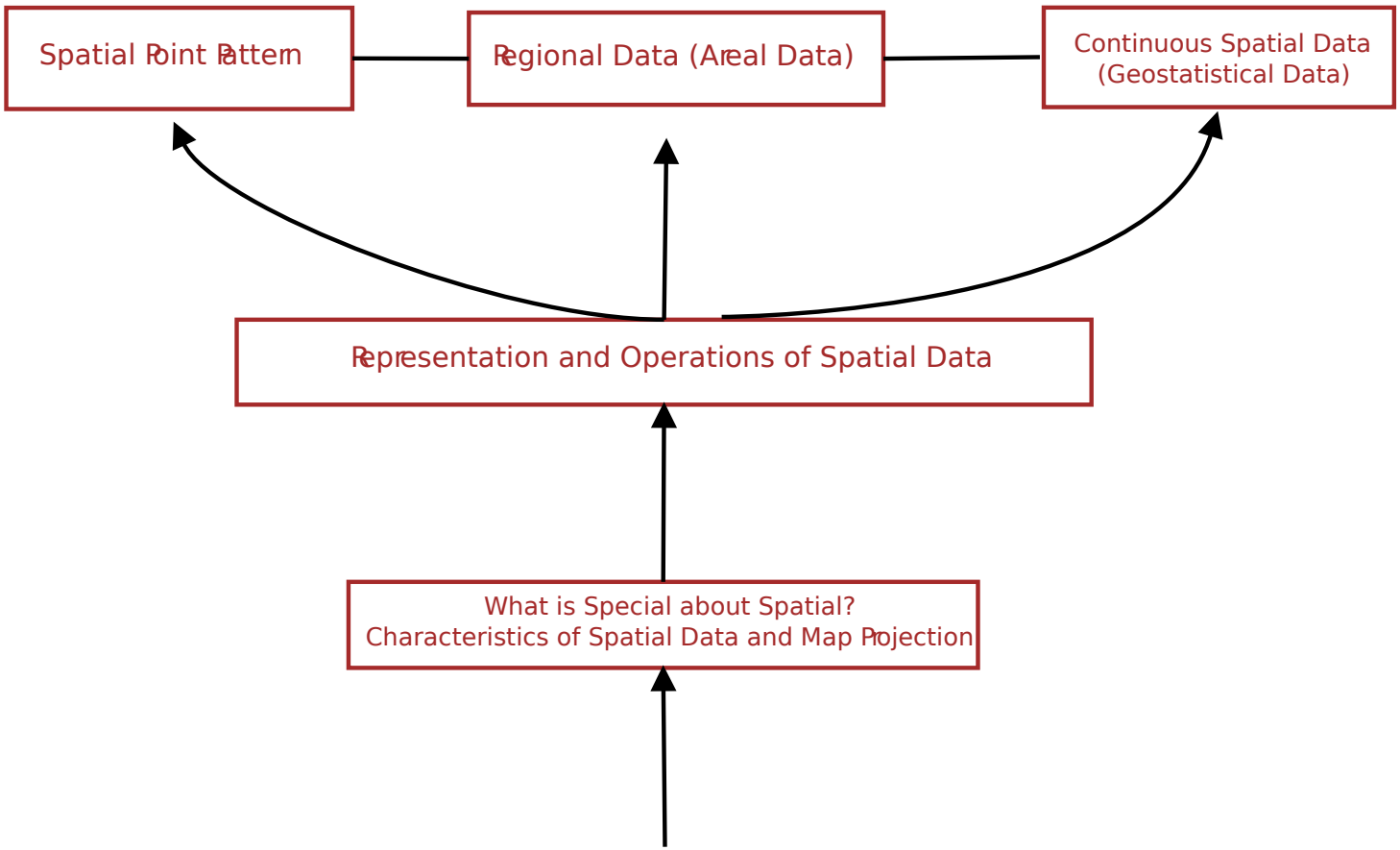
Course Outlines



Map Projection

- Elements in map projection
  - datum
  - developable surface
  - projection
- Distortions
  - distance
  - shape
  - area
  - direction
- how to choose map projections?
  - depending on purposes, you may need to preserve a certain spatial property - most commonly shape or area - to achieve that purpose

What is special about spatial

Characteristics of spatial data

- spatial (auto/cross-)correlation (spatial context or spatial pattern in different context)
- spatial heterogeneity
  - Simpson paradox in a spatial setting
- fractal behaviors
  - scale issues
  - measuring the length of coastline of Maine
  - travel traces of 'ants' vs. 'elephant'

Spatial Data Types

Data types

- spatial point pattern
- areal data
- geostatistical data
- network data

Representations of spatial data (i.e., spatial database basics)

- object-based
  - geometric primitives: points, lines and polygons
  - convex hull, Voronoi diagram, Delaunay triangulation
  - primitive operations: point-in-polygon, buffer
  - spatial query and spatial join
  - data structures for spatial data
    - spaghetti models
    - NAA
- field-based
  - points
  - contours
  - raster/lattice
  - triangulation (Delaunay triangulation)

Statistical tools

- histogram
- mean, median, variance
- z-score
- covariance, correlation coefficient
- p-value
- QQ-plot, box-plot

Format

Exam format

- Thursday 12:30-1:30pm
- open books and open notes, but access to any digital devices (e.g, phones, tables, computers) are not allowed
- multiple choices plus writing questions

Thanks

Thank you, any questions/comments