GIST 4302/5302: Spatial Analysis and Modeling

Review

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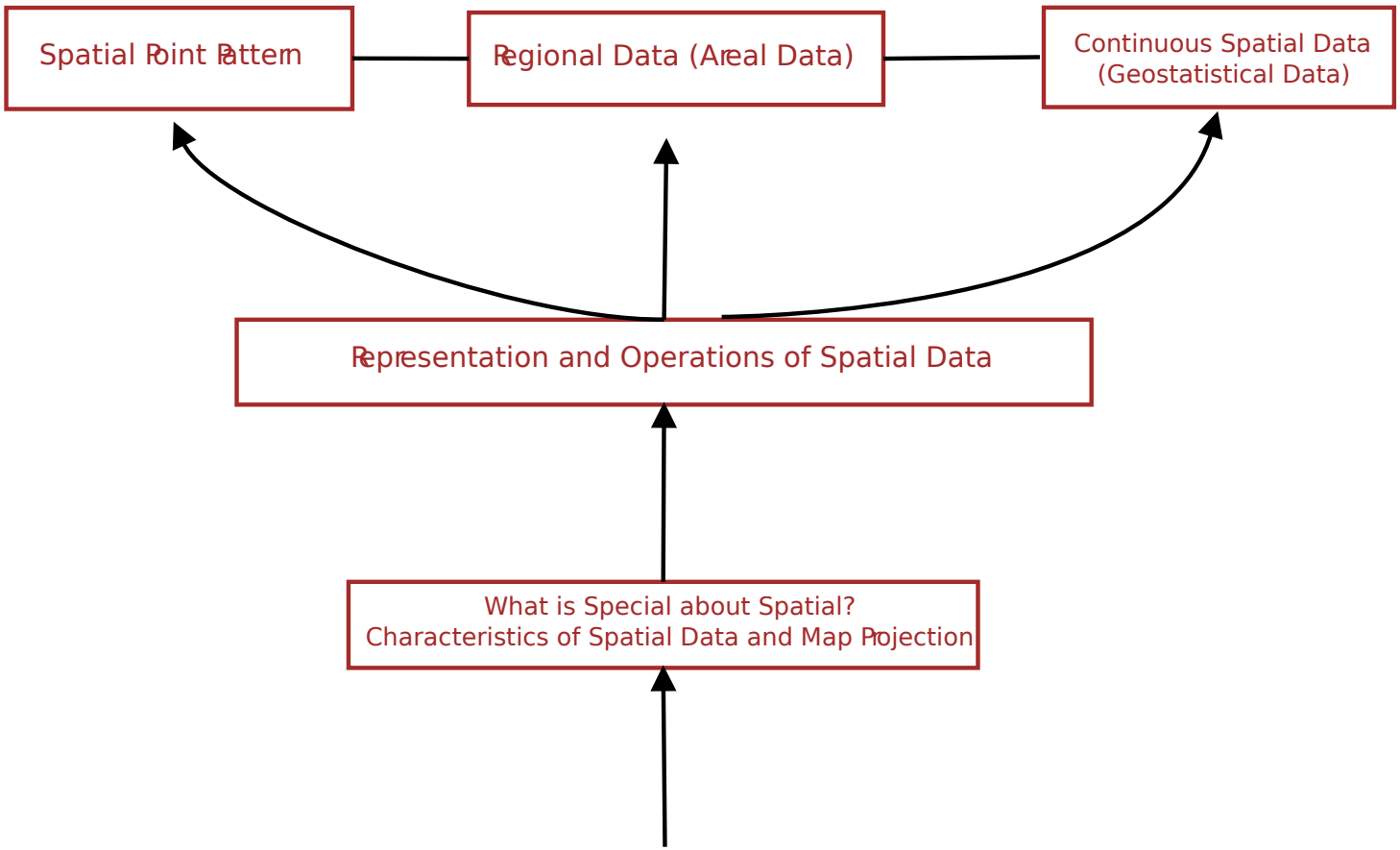
Course Outlines



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'

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

- object-based
  - geometric primitives: points, lines and polygons
  - convex hull, Voronoi diagram (dual graph of Delaunay triangulation)
  - vector analysis
    - point-in-polygon
    - buffer
    - spatial query
    - overlay, spatial join
  - data structures for spatial data
    - spaghetti models
    - NAA

Representation of spatial data

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

- field-based
  - representation: points, contours, raster/lattice, triangulation (Delaunay triangulation)
  - raster analysis:
    - local operators: map algebra
    - focal operators: focal statistics, aspect, slope
    - zonal operators: zonal statistics, viewshed, watershed analysis

Model builder

- Automate processing, graphic programming, reproducibility

Geocoding

- Converting human readable address to geographic coordinate pairs

Format

Exam format

- Tuesday 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 (multiple correct answers) plus writing questions

Thanks

Thank you, any questions/comments