Idiom: dynamic filtering
• item filtering
• browse through tightly coupled interaction
– alternative to queries that might return too many or too few

Idiom: DOSFA
• attribute filtering
• encoding: star glyphs

Idiom: scented widgets
• augment widgets for filtering to show information scent
– cues to show whether value in dataset

Idiom: histogram
• static item aggregation
• task: find distribution
• data: table
• derived data: table
– new table: bins are bins, values are counts
– bin size crucial
– pattern can change dramatically depending on discretization
– opportunity for interaction: control bin size on the fly

Idiom: Hierarchical parallel coordinates
• dynamic item aggregation
• derived data: hierarchical clustering
• encoding:
– cluster band with variable transparent line at mean, width by min/max values
– color by proximity in hierarchy

Dimensionality reduction for documents

Continuous scatterplot
• static item aggregation
• task: find distribution
• data: table
– derived data: table
– key attributes
– least squares depth
– density
– space-filling 2D matrix
– color: sequential, categorical hue + ordered luminance levels

Dimensionality reduction
• attribute aggregation
– reduce low-dimensional target space from high-dimensional measured space
– case when you can’t directly measure what you care about
– true dimensionality of dataset conjectured to be smaller than dimensionality of measurements
– latent factors, hidden variables

Continuous scatterplot
• static item aggregation
• task: find distribution
• derived data: table
– key attributes
– least squares depth
– density
– space-filling 2D matrix
– color: sequential, categorical hue + ordered luminance levels

Idiom: boxplot
• static item aggregation
• task: find distribution
• data: table
– derived data: table
– 5 quantile attributes
– median control box
– lower and upper quartile boxes
– lower and upper fences
– outliers
– outliers beyond fence cutoffs explicitly shown

Idiom: histogram
• static item aggregation
• task: find distribution
• data: table
– derived data: table
– key attributes
– least squares depth
– density
– space-filling 2D matrix
– color: sequential, categorical hue + ordered luminance levels

Idiom: boxplot
• static item aggregation
• task: find distribution
• data: table
– derived data: table
– 5 quantile attributes
– median control box
– lower and upper quartile boxes
– lower and upper fences
– outliers
– outliers beyond fence cutoffs explicitly shown

Idiom design choices: Part 2
• reduce/increase: inverses
• filter
– use straightforward and intuitive
– to understand and compare
– context of out of sight, out of mind
• aggregation
– use information about whole set
– context of avoiding signal
– not mutually exclusive
– combine filters, aggregates
– combine reduce, change, facet

Space-time aggregation
– gerrymandering (manipulating voting district boundaries) is one example!
Dimensionality vs attribute reduction
- vocab use in field not consistent
  - dimension/attribute
- attribute reduction: reduce set with filtering
  - includes orthographic projection
- dimensionality reduction: create smaller set of new dims/attrs
  - typically implies dimensional aggregation, not just filtering
  - vocab: projection/mapping

Further reading
- Chap 15: Case Studies

Next Time
- Thu Mar 2, to read
  - VAD Ch. 15: Case Studies
  - several examples of analysis with full framework
- reminders:
  - meetings due by Fri Mar 3, 5pm
  - proposals due by Mon Mar 6, 5pm

Idiom: Fisheye Lens
- distort geometry
  - shape: radial
  - focus: single extent
  - extent: local
  - metaphor: druggable lens

Idiom: Stretch and Squish Navigation
- distort geometry
  - shape: rectilinear
  - foci: multiple
  - impact: global
  - metaphor: stretch and squish, borders fixed

System: TreeJuxtaposer

Embed: Focus+Context
- combine information within single view
- elide
  - selectively filter and aggregate
  - superimpose layer
- distortion design choices
  - region shape: radial, rectilinear, complex
  - how many regions: one, many
  - region extent: local, global
  - interaction metaphor

Distortion costs and benefits
- benefits
  - combine focus and context information in single view
- costs
  - length comparisons impaired
  - network/cluster topology comparisons unfeasible
  - connection, containment
  - effects of distortion unclear if original structure unfamiliar
  - object constancy/tracking impaired

Further reading
- Chap 14: Embed: Focus+Context