PBO Workshop

Getting Excited About Data Visualization With d3

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[1] Cornerstone Systems NW

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The Philosophy of d3

- d3 isn't "just" a charting library
- It is a tool for building dynamic and interactive visualizations
- But, it does come with (a quickly growing number of) examples and layouts

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- d3 is small and doesn't pollute the global namespace
- d3 honors modern web standards instead of reinventing them
- This empowers developers with reusable knowledge
- d3 exposes fine-grain control
- d3 does "one" thing and does it well, reminiscent of the UNIX spirit

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d3 Solves the Cruxes of Visualization

- Enables the binding of data to styled presentation elements
  - Provides the ability to update, append and remove these bonds
  - Provides the ability to obtain and update new data by url (formats include text, json, xml, html, csv)
  - Provides transitions between different presentation styles in response to user interaction

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- Provides scales to define the mapping between between data and pixels
  - Quantitative scales for continuous domains (linear, power, log, etc.)
  - Ordinal scales for categorical domains
- Targets the browser, making it ideal for quickly reaching a wide audience
  - And there is a story for getting to print

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- d3.js is loosely associated with the Stanford Visualization Group
- Supersedes the ProtoVis project, so resources found there can be relevant
- Mike Bostock is the primary author
- Open sourced on GitHub.com
- Only a year or two old

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Background, cont.

It largely targets the SVG element, which is being increasingly supported across all major browsers:

- Internet Explorer, 9+
- Chrome
- Firefox
- Safari
- iOS
- Android, 3.0+
- Opera, 9.5+

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Examples: UK University Statistics

- A dynamic linked tree-map and line-chart
  - Note the disparity between rising applications and acceptance rates
  - Show the increasing applications from women relative to men
  - Show the dramatic increase in 25-39 year old women applications

subsectionLinked Scatter, Area, Line, and Bar charts

Examples: World Water Resources

- Linked scatter, line, and bar charts
  - Show the island and desert nations
  - There should be a navigation map
  - There should be a tooltip upon mouseover in the upper-right plot
  - Show Papua New Guinea's low water usage

Examples: Anderson's Data of Iris Flowers on the Gaspe Peninsula

- The scatterplot matrix visualizations pairwise correlations for multi-dimensional data
- Selection of subgroups in a scatterplot matrix

Examples: Show Reel

- Just a gratuitous example of transitions

Examples: US Population by Age Over the Years

- Note the aging out on the left side of the page
- This graphic motivates our final exercise this afternoon

Examples: Where Does Our Tax Money Go?

- Note the differences between $25k, $250k, $2.5 million

Examples: Startup Weekend Map

- I taught an Architect that had never coded before how to do this in about two days

Examples: Circos

- A multi-scale chord diagram denoting association between different genetic information

Examples: Trulia House Hunting

- Note the incredibly high mobile usage in Washington vs. Montana
- Note the dramatic difference in usage times between the two as well