Learning D3.js Mapping

[Book mission]

# Audience

*This book is targeted towards someone with a passing knowledge of web development (basic HTML/CSS/JavaScript). No previous mapping or D3.js experience necessary.*

# Mission

*Define what the book is going to DO for its readers… what is the goal that the book works towards? This will usually start with a practical verb: “build”, “create”, “develop”.*

*Build interactive maps with d3.js and learn how to optimize your code for testability as well as data management and compression.*

# Objectives and achievements

*List the book’s key objectives here. What will the reader achieve with this book?*

*Have a solid base out of which you can build visualizations*

*Learn all the ins and outs of comprehensive SVG geometric shapes*

*Learn to manage map data and plot it with d3.js*

*Add interactivity and points of interest to your maps*

*Compress and manipulate geoJSON files with the use of topoJSON*

*Learn how to write testable d3.js visualizations*

# Detailed outline

# **1: GATHER YOUR CARTOGRAPHER'S TOOLBOX ( ) Pages**

**Description: This chapter sets up the reader with a working example ready to be executed. It gets the reader to install all core libraries needed in order to build upon visualizations and then maps.**

**Level:** BASIC

**Topics covered:**

* Quick bootstrap
* Step-by-step bootstrap
* Installing key libraries and tools
* Using the web browser as a development tool

**Skills learned: Setting up the basic code blocks needed in order to build maps with d3.js. Quick utilization of topoJSON to handle topographies instead of geometries. Utilizing the chrome dev tools.**

# **2: CREATING IMAGES FROM SIMPLE TEXT**

**Description: Learn how SVG manages to plot into the DOM and what are the core geometric shapes it uses. Covers everything from geometric shape to vector paths which allow us to ultimately plot maps.**

**Level:** BASIC

**Topics covered:**

* Introduction – general knowledge
* Positioning elements
* Line
* Rectangle
* Circle
* Polygon
* Path
* Transform
* Grouping
* Text

**Skills learned: SVG and its core geometric shapes.**

# **3: PRODUCING GRAPHICS FROM DATA – THE FOUNDATIONS OF D3**

**Description: Understand the inner workings of d3.js and how it reconciles data with DOM. This chapter is key in order to get robust and beautiful interactivity within the visualizations developed.**

**Level:** MEDIUM

**Topics covered:**

* Creating basic SVG elements
* Enter
* Update
* Exit
* AJAX

**Skills learned: D3.js lifecycle (Enter, Update, Exit). With this core concept understood one can add animation data flow easily within d3.js**

# **4: CREATING A MAP**

**Description: This chapter is where the reader will build a map from scratch given a data source of Mexico. We start by plotting and then add animations via colour transitions, ending with some basic events like clicks and hovers.**

**Level:** MEDIUM

**Topics covered:**

* Foundation – creating your basic map
* Experiment 1 – adjusting the bounding box
* Experiment 2 – creating choropleths
* Experiment 3 – adding click events to our visualization
* Experiment 4 – using updates and transitions to enhance our visualization
* Experiment 5 – adding points of interest
* Experiment 6 – adding visualizations as a point of interest

**Skills learned: Map creation in d3.js. Via the use of paths and geoJSON files that are compressed with topoJSON the user will have multiple examples of maps and also then the basics interactivity within maps.**

# **5: CLICK-CLICK BOOM! APPLYING INTERACTIVITY TO YOUR MAP**

**Description: Covers in depth interactivity with maps extending from basic clicks and hovers to zooms, pans and dragging.**

**Level:** MEDIUM

**Topics covered:**

* Events and how they occur
* Experiment 1 – hover events
* Experiment 2 – tooltips with visualizations
* Experiment 3 – panning and zooming
* Experiment 4 – orthographic projections
* Experiment 5 – rotating orthographic projections
* Experiment 6 – dragging orthographic projections

**Skills learned: Adding complete interactivity into a map that include both basic clicks to advanced zooms and animations with different types of projections (3d maps)**

# 6: FINDING AND WORKING WITH GEOGRAPHIC DATA

**Description: Leveraging map data is hard and tedious and in this chapter we share key sources to finding that data and compressing it according to the reader’s needs. We cover deeploiy topoJSON and the differences between managing topographies and geometries.**

**Level:** ADVANCED

**Topics covered:**

* GeoData file types
* Summary

**Skills learned: Compression and conversion of geoJSON data files.**

# **7: TESTING**

**Description: All good code should be easy to test but with d3.js its surprisingly difficult to achieve. In this chapter we introduce a well-defined pattern that will allow the reader to write testable code and then proceed to write unit tests to accompany the example.**

**Level:** ADVANCED

**Topics covered:**

* Code organization and reusable assets
* Project structure
* Writing testable code
* Unit testing
* Creating resilient visualization code

**Skills learned: Writing testable code, structuring your visualization so that it’s easy to test**