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D3.js IN ACTION

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Welcome

Thank you for purchasing the MEAP for *D3.js in Action*. To get the most benefit from this book, you'll want to have some established skills in programming, with experience in HTML5 and basic knowledge about CSS and DOM, or be transitioning from dealing with data in R/Python/SQL with the desire to build more sophisticated shareable applications.

When I first started experimenting with D3 two years ago, it was out of necessity. Flash was dead, and I needed an information visualization library that was feature rich and, hopefully, long lived. D3 proved to be more than that, with robust capabilities not only for data visualization, but for creating complex applications on the web.

Since that time, there have been numerous examples, some really great introductions to the library, and a few cookbooks to help new users learn the basics and get specific tasks done with D3. In contrast, *D3.js in Action* is my attempt to produce an exhaustive, highly informative, deep dive into the library, one that covers the fundamental structures of how D3 works with data to produce the stunning products we're all so impressed by. D3 does a lot, and not just with graphics, and I've tried to explain in detail the whole library.

Along with all that, I also wanted to focus on two specific spheres that D3 handles really well: networks and maps. As a result, this book spends a full chapter on each, dealing with the variety of features and functions in D3 that let you create the most amazing network visualizations and online interactive mapping applications. This is along with chapters that focus on general charts and D3-specific layouts more broadly.

Finally, throughout *D3.js in Action* you'll see an approach that embraces the functionality available in modern browsers.

It's a big book for a big library, and I hope you find it as useful to read as I did to write it. Please be sure to post any questions, comments, or suggestions you have about the book in the Author Online forum. Your feedback is essential in developing the best book possible.

— Elijah Meeks

brief contents

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An introduction to D3.js

1.1 What is D3?

Data-Driven Documents is a brand name. It's what "D3" stands for. But it's also a class of applications that have been offered on the web in one form or another for years. Whether as interactive dashboards, rich internet applications, or dynamically driven content, we've been building and dealing with data-driven documents for quite some time. So in one sense, the D3.js library is an iterative step in a chain of various technologies used for data-driven documents, but in another sense, it is a radical one.

D3.js comes out of a need for robust data visualization on the web, but does more than that because of its robus design. Coming out of the data visualization program at Stanford Computer Science, Mike Bostock worked with Jeff Heer and Vadim Ogievetsky to create Protovis, which like D3.js is a JavaScript library designed for information visualization but which was designed to provide compatibility with older browsers. Bostock also developed Polymaps, another JavaScript library which provided vector and tile mapping capability in a lightweight form. These earlier endeavors would inform the creation of D3.js, which focused on modern standards and modern browsers. As Bostock describes it, "This avoids proprietary representation and affords extraordinary flexibility, exposing the full capabilities of web standards such as CSS3, HTML5 and SVG." This is the radical nature of D3.js. It will not run on Internet Explorer 6, and while that cost may be too much to bear for certain developers, the wide adoption of standards on modern browsers has finally afforded the capacity to break with the past. In that regard, D3 is a sign of the new capabilities that let web developers deliver dynamic and interactive content seamlessly in the browser.

The iterative nature of D3.js comes from its resemblance to earlier methods of deploying rich interactivity to the web, such as Flash using ActionScript3. As I or any other former Flash developer can tell you, the period after which Steve Jobs condemned Flash--but before the maturation of JavaScript engines and browsers--was a difficult one. You simply could not build