D3 for R Users

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Chapter 1

Jump in the deep end

Let's skip the explanations and start coding in D3 right now. Why? So you can see the benefits and know what you're working toward when you get stuck in the weeds. Then we'll go back and start learning step by step.

What you need

Chrome browser

Elements

1. Open a *downloaded version* of `shapes.html`.

You can obtain a downloaded copy of the file by:

- clicking here and then File, Save Page As…

or

- downloading a ZIP of the whole repo by clicking here

or

- forking and cloning the repo

2. Click *View, Developer, Developer Tools,* then the `Elements` tab.
3. Hover the mouse over various elements in the `<body> ... </body>` section.
4. Click the Console tab. Type `d3.select("circle").attr("cx", "200");` at the prompt (`>`), press enter and see what happens.
5. Now try some of the following and/or experiment on your own with changing attributes of the circle:

    ```
    d3.select("circle").attr("cx", "300");

    d3.select("circle").attr("cx", "400");

    d3.select("circle").attr("cx", "500");

    d3.select("circle").attr("cx", "600");
    ```

```
d3.select("circle").attr("cx", "100");

d3.select("circle").attr("r", "30");

d3.select("circle").attr("r", "130");

d3.select("circle").attr("r", "3");

d3.select("circle").attr("r", "30");

d3.select("circle").attr("fill", "red");

d3.select("circle").attr("fill", "aliceblue");

d3.select("circle").attr("fill", "lightseagreen");
```

6. Refresh the page. What happened?

7. Go to Elements. Look at the value of the `y1` attribute of the SVG `<line>` element. Go back to the Console and enter the following:

```
d3.select("line").attr("y1", "10");
```

8. Go back to Elements and observe. What happened?

9. Stay in Elements and refresh the page. What happened to `y1`?

10. Now back to the Console to make style changes to the HTML elements:

```
d3.select("h1").style("color", "purple");

d3.select("h2").style("font-size", "50px");

d3.select("h2").style("font-family", "Impact");
```

Part B: Transitions (Ch. 9)

1. Try these:

```
d3.select("circle").transition().duration(2000).attr("cx", "400");

d3.select("ellipse").transition().duration(2000).attr("transform", "translate (400, 400)");

d3.select("line").transition().duration(2000).attr("x1", "400");

d3.select("line").transition().duration(2000).attr("y1", "250");

d3.select("p").transition().duration(2000).style("font-size", "72px");
```

2. Experiment with more transitions.

Part C: Interactivity (Ch. 10)

1. Set up a function to turn the fill color to yellow:

```
function goyellow() {d3.select(this).attr("fill", "yellow")};
```

2. Add an event listener to the circle that will be trigger a call to `goyellow()` on a mouseover:

```
d3.select("circle").on("mouseover", goyellow);
```

3. Test it out.
4. Add the same event listener to the ellipse. Test it out.
5. Create a function `goblue()` that changes the fill color to blue.
6. Add event listeners to the circle and ellipse that will trigger a call to `goblue()` on a *mouseout*. Test out your code.
7. Try out a click event. (Note the use of an anonymous function.)

```
d3.select("line").on("click", function()
  {d3.select(this).attr("stroke-width", "10");});
```

8. Try another click event. What's happening?

```
d3.select("svg").on("click", function()
  {d3.select("text").text(`(${d3.mouse(this)})`)});
```

Chapter 2

Introduction

Although it has plenty of new material and exercises, this book frequently references Scott Murray's *Interactive Data Visualization for the Web, 2nd edition*, a required book for GR5702. As such this resource is more a supplement to *IDVW2* rather than an alternative.

IDVW2 is the gold standard for learning D3. You may be wondering, why do we need any extra material? Here's why:

- *IDVW2* is written for graphics designers not data science students so the pain points are somewhat different. As the title states, my intended audience is R users, though you certainly don't need to know R to use this resource.
- *IDVW2* does not use certain ES6 conventions which make coding easier (and more like R!)
- *IDVW2* does not include examples involved advanced statistics.
- I prefer presenting some of the material in a different order than presented in *IDVW2*.

None of this detracts from the fact that *IDVW2* is absolutely essential to learning D3. Although we will consider different examples, you are encouraged to study Murray's code examples in addition to reading the text.

Chapter 3

Web Technologies

Prequisites for learning D3 include a basic understanding of:

1. HTML – the language of the web
2. CSS – used for styling web pages, and more importantly for our purposes, selecting elements on a page or in a graphic
3. SVG – the graphics format that we will be using
4. JavaScript – language for making web pages interactive, animated, code is executed when page is opened or refreshed

As our focus is D3, not building complex web sites with multiple pages, we will learn minimal amounts of these technologies on a need to know basis.

HTML

Learn to use Chrome Developer Tools

1. Opening Chrome: click *View, Developer, JavaScript Console.* (There are other ways to open Chrome DevTools).
2. Using the JavaScript Console to execute code, not necessarily connected with the current page.
3.

Chapter 4

Back to D3

Some *significant* applications are demonstrated in this chapter.

Example one

Example two

Chapter 5

Final Words

We have finished a nice book.

Chapter 6

Scales