Homework 1 - Javascript and D3 Basics

Due Friday by 11:59pm **Points** 100 **Submitting** a website url **Available** after Mar 27 at 12am

Summary

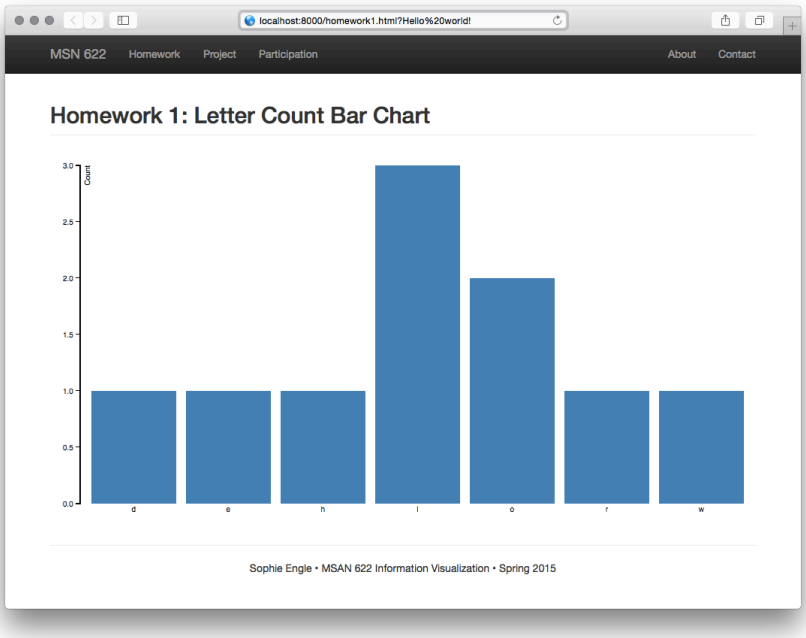
This homework will introduce you to both JavaScript and D3. Your homework will count the letters entered in the query string of the URL, and display a bar chart of those counts.

C-Level Functionality

Using JavaScript, create a letter counter as follows:

1. Get the query string from the page URL, **decode** (https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/decodeURI) the text, and convert it to lower case.
2. Loop through the text and store the count for all **letters** (`[A-z]`) in a JavaScript **object** (https://developer.mozilla.org/en-US/docs/Web/JavaScript/Guide/Working_with_Objects) (similar to a dictionary in Python). Use the letter as the key and the count as the value. *Do not store spaces, punctuation, or special characters.*
3. Log the decoded input text and counts to the console.
4. Display a basic non-interactive bar chart of the counts using D3 in an SVG. You can use the final code (**source** (http://bl.ocks.org/mbostock/3885304)) from the bar chart tutorial (**link** (http://bost.ocks.org/mike/bar/)) as a starting point.

Below is a simple example. Your submission does not need to be identical in aesthetics!



You must complete this functionality to earn a C-level grade (C-, C, or C+) on this assignment. You may not work on B-level functionality until this is complete.

B-Level Functionality

Customize the aesthetics and settings beyond what is provided in the tutorials. For example, you can:

- Modify the tick label formatting (e.g. change number of decimal points visible, size, spacing and/or frequency).

- Modify the underlying grid and axis lines (e.g. adding/removing grid lines, changing color or line thickness of axis lines).
- Modify the bar colors (e.g. color vowels differently from consonants).
- Modify the sort order (e.g. sort alphabetically vs sort by value).

You need to make at least 4 distinct changes from at least 2 different categories from above* to satisfy these requirements. From there, the number and type of changes will influence whether you earn a B-, B, or B+ grade.

**You can suggest other changes on Piazza, but must do so in a public post (can be anonymous) so everyone is aware of the additional options.*

You must complete this functionality to earn a B-level grade (B-, B, or B+) on this assignment. You may not work on A-level functionality until this is complete.

A-Level Functionality

Customize how users can interact with your visualization. For example, you could choose one or more of the following:

- Show a grid line at the mouse y-position (behind the bars) when mouse is hovered over plot area, and show exact value for that line.
- Add a button that allows you to change between sorting alphabetically and sorting by value (**example** (http://bl.ocks.org/mbostock/3885705)).
- Add a tooltip that shows the exact value of a bar when hovering over it.
- Figure out how to add a search box on the page, and show the word count for the text in that box instead of from the URL query string.

Note: One of the tutorials provides code to change the color of the bar when the mouse hovers over it. This does NOT count towards this category, since it was provided to you.

**You can suggest other changes on Piazza, but must do so in a public post (can be anonymous) so everyone is aware of the additional options.*

You must complete this functionality to earn a A-level grade (A-, A, or A+) on this assignment.

Resources

For JavaScript, I recommend the Mozilla Developer Network (MDN) developer guides at:

https://developer.mozilla.org/en-US/docs/Web/JavaScript (https://developer.mozilla.org/en-US/docs/Web/JavaScript)

This website is ad-free and lets you know when the method is experimental or deprecated, and its browser compatibility.

For learning how to make a bar chart in D3, I suggest either of these guides:

http://bost.ocks.org/mike/bar/ (http://bost.ocks.org/mike/bar/)

http://alignedleft.com/tutorials/d3/making-a-bar-chart (http://alignedleft.com/tutorials/d3/making-a-bar-chart)

For figuring out how to parse the query string in JavaScript, go to the following URL:

http://www.example.com/?Hello,%20world! (http://www.example.com/?Hello,%20world!)

And, in the console of your **webkit** (http://en.wikipedia.org/wiki/WebKit) browser, enter the following:

```
decodeURI(window.location.search)
```

You should be able to figure out how to move forward from there.

Submission

Create a webpage on your submission website for this homework. Link to the homework page on the home page of your submission website, and submit the link to the homework page in Canvas. *(Please double-check this link is to your homework page, and not your home page.)*

In addition to what is required by this homework, you should have the following information on your homework page:

- Your full name and a link to the homework code in your repository.
- A brief list of the functionality you implemented. This is for grading purposes---it lets us know what to look for. Be specific, and use appropriate HTML elements (such

as headers and lists) to ease reading. If you forget to list something, it is likely the teacher assistant will misses it when grading!

- A short (1 to 3 paragraphs, 3 to 5 sentences per paragraph) discussion about the functionality you implemented. Focus on providing motivation behind some of your design decisions (e.g. why you choose to remove/add an element, how you decided on colors, etc.). This discussion could influence how your visualization is evaluated in peer reviews. You do not need to re-list everything you implemented!

There is no late homework. There is no reason why you cannot submit this link on time, since you can submit it before you are finished with the assignment. We will look at the timestamps on your repository to verify you completed the functionality on-time.