Prep work Side Project

A Challenging Stretch Project for Advanced Students

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Introduction & Background

Congratulations for being one of a select few students selected for Lighthouse Labs' Prep work Stretch Project. We unlock this project assignment for students who performed above expectations and excelled at completing the core and stretch prep work.

Unlike traditional education, every student that attends Lighthouse Labs has had a very different educational and professional background. Some of ours students have a background or even work experience with software, while others will be learning to code for the first time.

Despite being a very intense, fast-paced learning environment, we try to do our very best to cater to these various levels and backgrounds. This stretch project is one such example. We had received feedback that our prep material on Compass, including the stretch work it contains, is not challenging enough for some of our more advanced students. Stretch projects such as this allow us to push them further.

Prerequisites

Before starting this project, it is expected that you have completed *all* of the prep-work content located in Compass, including the stretch work.

That said, please be advised that this project does not simply build on that knowledge. You are expected to self-learn other programming techniques, best practices, as well as libraries in order to successfully complete this project.

Prior Knowledge & Experience

While it may seem otherwise at first glance, this project does not assume that you have a background with technology or with programming.

That said, this project is intentionally a very big jump from the challenges you encountered in the prep work. It is not meant to be easy nor a natural progression to the content covered earlier as it is designed in order to challenge and test your ability to rapidly learn and grow without regular amounts of direction.

The focus here is on problem solving while learning new concepts. It is for individuals who are already comfortable with the fundamentals of code (functions, objects, arrays, conditionals, loops). If you find that you could use more general practice with these concepts, please consider tackling the smaller stretch challenges instead of this project.

You may find yourself completely stuck on this exercise, not knowing how to solve a particular problem or fix a particular error, please do not waste hours trying to tackle it. We

suggest that you instead take a break and switch to the other smaller challenges provided to you. This will help you flex some of your programming muscles and better prepare for this project as well as the bootcamp pace.

Duration

This project should take you 20 to 40 hours to complete. We strongly suggest allocating large (3+ hour) focused sessions as is common practice and necessity amongst professional developers.

Assessment

This stretch project is of course optional. Should you choose to complete it, we also have a process for having it reviewed by our instructors. This review allows us to help you improve your code with tangible feedback while also serving as an assessment tool for us.

In order to be tangible and objective with our assessment, an evaluation rubric has been sent along with this doc. Use this as a guideline for how you will be assessed for this project.

Should you successfully complete this stretch project, we may decide to further challenge you during the course of the bootcamp program with another even more involved stretch project.

That's right, your reward for excelling even more with us is... more work. Welcome to bootcamp!

Deadline

In order to have your submission reviewed successfully and to qualify for further stretch projects during bootcamp, you must submit your work **prior to day one of bootcamp**.

General Rules

- No collaboration of any kind (peers, mentors, friends, etc) is allowed. Think of this as a solo challenge / test
- Similarly, you may not post questions or answers to this project on our web prep help forum or other external forums.
- Do not attempt to directly google solutions to this problem (eg: "example code for simple bar chart library"). The goal is to problem solve and create the logic yourself. That said, you are of course allowed to google and read up on technologies or concepts that you may be unfamiliar with, such as jQuery.
    - Keep track of which tutorials, example solutions, reference documentation or other material you used in order to learn along the way. You will be asked to submit this list.

About The Project

This project will consist of building a library that will allow other developers to generate bar charts on their web pages using HTML, CSS and JavaScript. You'll also be using jQuery to access and manipulate the DOM in order to draw the charts.

There are intentionally no visuals provided with this project, and many aspects of the UI are left intentionally vague. We are leaving you freedom to get creative with the UI. We encourage you to make the charts look presentable and even add extra flare with things like CSS transitions and animations.

Getting Started

1. Fork this gist into your account, then clone it to your computer. You can find the clone URL under the **embed** dropdown on the top right hand side of the gist. You'll need to fork this gist in order to be able to push up your changes for submission.
2. Take a look at adding a linter into your text editor of choice, there is ESLint for Atom, ESLint for Sublime Text or ESLint for VSCode. Otherwise you can use the command line by running `eslint` from the command line. Take a look at the ESLint documentation for instructions.
3. Set up an HTML page to be the basis of your application. You should be able to just open the page directly from your file system, you shouldn't need to set up a server for this project. Also, make sure this HTML page also pulls in jQuery.

Tips

- Read through the jQuery documentation or find some simple tutorials on jQuery. This will help you get a handle on how to access and create DOM elements using jQuery.
- Commit at every step. No commit is too small, but at the same time commit code that is not going to throw an error. One massive commit with all your work is going to result in an unsatisfactory submission.
- Don't look at the code for other charting libraries to see how they're implemented, because it will either be overwhelming, overkill, or cheating.
- This should be completed in only HTML, CSS and JavaScript w/ jQuery. You may find references to using SVG or Canvas for your solution. However we strongly advise that you stay away from those approaches.
- Try to break your solution down into small functions that will work together to solve the problem. One massive function will not be accepted, for example.

Functional Requirements

- Simple API to draw a bar chart. You should implement at least this function:
    - `drawBarChart(data, options, element)`
        - The `data` parameter will be the data the chart should work from
            - Start with just an Array of numbers
            - e.g. `[1, 2, 3, 4, 5]`
        - The `options` parameter should be an object which has options for the chart.
            - e.g. `width` and `height` of the bar chart
        - The `element` parameter should be a DOM element or jQuery element that the chart will get rendered into.

Display Requirements

- Bar Chart
    - Display a list of single values, horizontally as a bar chart
    - Numerical values should also be displayed inside of the bar
        - The position of values should be customizable too:
            - Top, center or bottom of the bar.
    - Bar sizes should be dependent on the data that gets passed in:
        - Bar width should be dependent on the total amount of values passed.
        - Bar height should be dependent on the values of the data.
    - Bar properties that should be customizable:
        - Bar Color
        - Label Color
        - Bar spacing (space between bars)
- Bar Chart axes
    - X-axis should show labels for each data value
        - Think about how you would need to structure your data to associate a label to each value
    - Y-axis should show ticks at certain values
        - Think about where you would configure these values. Should they be part of the data or the options to the bar chart function.
- Bar Chart Title
    - The title of the bar chart should be able to be set and shown dynamically
    - Customizable:
        - Font Size
        - Font Colour
- Multiple Value bar charts
    - Allow the user to pass multiple values for each bar.
    - Think about how you would need to structure this data compared to a single bar chart.
    - This should also support all the features of the single bar chart, including
        - Customizable bar colors, per value

        - Customizable label colors

Submission Requirements & Process

- Push your project up to your gist.
- Create a demo `index.html` and setup Github Pages for your repo.
    - The `index.html` file should show a few different examples of your bar charts in action. Generating a few bar charts in a `$(document).ready()` function call is perfectly acceptable.
- Add a README.md file with the following information to your project. The README should be in Markdown format:
    - About
        - Give some context to what your project is for
    - Example Screenshots (embedded within the readme as image tags)
    - List the API functions that you would expect a user to use
        - Describe the function and the parameters to each function
    - A Feature list of your library (options it supports, etc)
    - A list of known issues / bugs
    - A list of features that are on the roadmap but haven't been implemented yet
    - A list of all the external resources (tutorials, docs, example code, etc) that you encountered and used to help you create this library

Once completed, please submit your project code to us via this Google Form.

If you have any questions about this project, please send us an email at web-prep-stretch@lighthouselabs.ca.

That's all for now. Thank you and Good Luck!