

## CSE 134B Homework 3

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### *Work Effort*

We spent at least 15 hours creating the vanilla CSS for our website. We wrote a total of 332 lines of code for the CSS files and a total of 551 lines for the HTML. Most of our work was spent setting up the design of each of our pages, as well as bug fixing to ensure that everything was working and aligned correctly.

For the Bootstrap version of our website, we spent 20 hours total. We wrote about 1,438 lines of CSS code and 943 lines of HTML. For the Bootstrap version, we wanted to try to minimize our work effort by using as many Bootstrap components and styles as we could. However, despite our efforts to decrease our custom CSS use, we ended up having use some custom CSS in order to get the look that we wanted. A big reason why we spent more time with Bootstrap was also because we had very little experience with Bootstrap and needed to learn the features and class selectors that it uses.

Despite the fact that we put more work effort into the Bootstrap version, we did so because it felt easier to make a more complete and fluid design. Had we tried to do the same design with vanilla CSS, the work effort would likely be an order of magnitude larger based on the differences between time spent and lines written.

HTML lines of code comparison <sup>1</sup>	Vanilla CSS ver.	Bootstrap 3 ver.
<i>Total:</i>	551	943
<i>Difference:</i>	392	

CSS lines of code comparison <sup>1</sup>	Vanilla CSS ver.	Bootstrap 3 ver.
<i>Total (w/o bootstrap.css):</i>	332	1,438f
<i>Total:</i>	332	8195
<i>Difference (w/ bootstrap.css):</i>	7863	
<i>Difference (w/o bootstrap.css):</i>	1106	

## Impact

There were some large differences when it came to using Bootstrap and styling our web application using vanilla CSS. When it came to file sizes for both versions, Bootstrap was by far larger, with the difference totalling to 148,265 bytes. This should cause the Bootstrap version to load slower than the vanilla CSS version. The reason for this large difference is due to importing the entire bootstrap.css file. Due to time's sake, we did not bother to try and tailor the Bootstrap file since we were not initially sure what we wanted or did not want to use. Our HTML files had increased a lot as well because many more wrapper divs as well as class attributes had to be added in order to utilize Bootstrap.

After testing with a Galaxy Note 5 and with 10 separate reloads using Chrome's debugging mode over WiFi, we found that our previous prediction was true. The Bootstrap version loaded a little over twice as slowly than the vanilla CSS version of our application, even though the ratio in byte sizing and timing is not 1 to 1. In fact the Bootstrap version performed surprisingly well for this fact. There may have been inconsistencies due to other devices on the network, but we figured an average over 10 separate reloads would help give us a good measurement of network performance.

Byte count comparison (#'s in bytes) <sup>1</sup>	Vanilla CSS ver.	Bootstrap 3 ver.
Total (HTML only):	15771	34851
Difference (HTML only):	19080	
Total (CSS only):	1561	134055
Difference (CSS only):	132494	
Total (HTML and CSS):	20641	168906
Difference (HTML and CSS):	148265	

Network Timing Avgs (Note 5, reloaded 10 times)	Vanilla CSS ver.	Bootstrap 3 ver.
index.html	122ms	195ms
login_signup.html	158ms	157ms
class_finder.html	136ms	178ms
overview.html	142ms	182ms

class_edit.html	139ms	171ms
class_rating.html	134ms	168ms
professors.html	144ms	543ms
prof_edit.html	72ms	135ms
prof_rating.html	133ms	167ms
ta.html	117ms	1097ms
ta_edit.html	97ms	259ms
ta_rating.html	117ms	144ms
feedback.html	123ms	172ms
<i>Total:</i>	1634ms	3,568
<i>Difference:</i>	1934ms	

### *Error Report*

We tried to make our vanilla CSS as responsive as possible. However, due to our CSS lacking a proper responsive framework, some of our elements may not fit the design of a traditional mobile app. Also the Bootstrap version may have some styling errors due to using Bootstrap components that we didn't have a full understanding over. We were unable to debug some of these styling inconsistencies.

### *Conclusion*

We conclude that vanilla CSS is great when used to style simple html pages that don't need many resources. Because of its simple nature, it can have fast load times on mobile devices. It is also useful when we need to create a certain styling that is not able to be created using pre-built frameworks. However, when our pages require multiple resources and elements, a framework like bootstrap helps speedup the process tremendously, while increasing the aesthetic appeal tremendously. Although in our case, our Bootstrap version took longer, it was without a doubt easier to create a very fluid web application. These types of frameworks are easier to implement for resource-heavy pages, but come at the cost of a slower performance on mobile. With proper framework knowledge and usage, we could definitely increase future performance with Bootstrap. Bootstrap even has a custom Bootstrap maker that can allow us to tailor the framework for better performance and more focused styling.

<sup>1</sup> For full detailed tables follow this link:

[https://docs.google.com/spreadsheets/d/1O05FNHCJG28j8\\_K1rGD5YdUaBKFV-Le3eVB64yUvT3E/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1O05FNHCJG28j8_K1rGD5YdUaBKFV-Le3eVB64yUvT3E/edit?usp=sharing)

