**Front End Modifications with Bootstrap**

Bootstrap makes the website more responsive and mobile-friendly. The examples in Figure 1 show the original website on the left side and the small-screen version on the right side. The display on the left screenshot is in proper layout, but when the screen is narrow, in which I simulate the display on a smartphone, the layout became unsatisfied. The text looks squeezed, the yellow-background <div> looks very narrow, and there is a blank section on the bottom-right corner.

In Figure 2, the modified version using Bootstrap looks more proper in its display. When the screen is narrow, the sections of the <div> stack on top of the other ones, and the text looks properly arranged. I also use the Bootstrap library to change the colors and fonts of the text to make it a more modern look.

A close up of a map

Description automatically generatedA screenshot of a map

Description automatically generated

Figure 4. The original website and the display on a small screen.

A close up of a map

Description automatically generatedA screenshot of a cell phone

Description automatically generated

Figure 5. Modified website using Bootstrap and its display on a small screen.

Here are some details and suggestions I have noticed when using Bootstrap:

* One can use either CDN or complied CSS and JS file of Bootstrap. The CDN seems handier and satisfies most use cases.
* Assuming we are designing a website for mobile phone users, “col-sm-\*” class for grid division for small devices should be used.
* I need to keep separate versions of codes for the mobile and the laptop page because the sizing system for bootstrap is specifically made by using xs, sm, md, and lg class.
* I changed the “map-canvas” class to 500px instead of 100%, or else, the map will disappear because of some display conflicts.

The map shows up when the index.html is opened in a browser, but sometimes it may disappear when it is run on Apache server using the Bootstrap library, the extra code for the “map-canvas” <div> will solve the issue:

<div id="map-canvas" class="col-sm-8"id="map-container-google-11" class="z-depth-1-half map-container-6" style="height: 450px"></div>

This code helps the app to adjust to different screen sizes:

<meta name="viewport" content="width=device-width,initial-scale=1"/>