PUI 8 Reflection

https://ndevired.github.io/homework8.github.io/Homework_8/home.html

https://github.com/ndevired/homework8.github.io

PART 1

Neuroscience is a difficult subject to study because of the various terms and concepts that students must quickly learn at the beginning of any introductory course. Specifically, the introductory concepts seem to be the most challenging and difficult to successfully understand and apply.

I created an informational tool that aims to break down these challenging introductory concepts into digestible bits of information that students can easily use to learn about the brain. The website uses several interactive visual components on each of the three pages to aid students through learning about the neuron and its various structures (Page 1), the action potential and how it is triggered (Page 2), and the different lobes and interior structures of the brain (Page 3).

Unlike a standard textbook that fails to provide an interactive component, this website makes use of interactive scalable vector graphics (SVGs). Users can click on various sections of the SVGs which results in that particular section being highlighted and provides a detailed description of the function of the structure/process, and how it interacts with other structures/processes. The interactivity of this website is what makes it truly stand out from other websites and other methods of learning.

The targeted audience is mainly geared towards students learning about these introductory neuroscience concepts or students who are looking to refresh or solidify their existing knowledge. However, this website can be used by anyone wanting to understand more about the brain, how it functions, and the beauty of neuroscience.

PART 2

I have divided the interactions into their four respective pages for simplicity.

- **Home Page**
  - The color of the “Welcome to Brainium!” title changes to white.
    - It can be reproduced by hovering over it.
  - The word “tool” is linked to the neuron page.
    - It can be reproduced by clicking on the word.
- **The Navigation Bar on the Neuron, Action Potential and Brain pages**
  - The color of each of the navigation bar headings changes to white and it is linked to each respective page.

        - The color change can be reproduced by hovering over it.
        - The linking can be reproduced by clicking on the words.
    - The Brainium logo and the Brainium title are linked to the home page
        - It can be reproduced by clicking on either option.

- **Neuron Page**
    - The information for each structure will be updated on the right side if viewing on a desktop or beneath the SVG if viewing on mobile.
        - This is reproduced by clicking on each structure.
        - The purple structure on the leftmost side should display information about the dendrite.
        - The large orange structure within the dendrite should display information about the soma.
        - The yellow structures should display information about the myelin sheath.
        - The mini orange structures within the myelin sheath should display information about the nucleus.
        - The mini purple structures that lay between the myelin sheath should display information about the Nodes of Ranvier.
        - The purple structure on the rightmost side should display information about the terminal.
    - The structures will change to white (change in state).
        - This is reproduced by hovering over each structure, it will revert to its original color when the user is not hovering.
- **Action Potential Page**
    - The “What is an Action Potential?”, “Action Potential Steps”, and “Action Potential Graphs” titles will change to white.
        - This is reproduced by hovering and will not revert to the original color.
    - “An action potential is a temporary change in the negative state of the membrane potential to a positive state because of the flow of these ions” will change to white.
        - This is reproduced by hovering and will not revert to the original color.
    - The accordion will drop down to reveal the content in each container.
        - This is reproduced by clicking on the word or the number.
    - The respective numbers will appear on the action potential graph in the respective positions (change in state).
        - This is reproduced by clicking only on the number.
- **Brain Page**
    - Cerebral Cortex
        - The information for each lobe will be updated on the top right side if viewing on a desktop or beneath the SVG if viewing on mobile.
            - It is reproduced by clicking on each lobe.

                - The content displayed should match with the labeling.
            - The structures will change to white (change in state).
                - This is reproduced by hovering over each structure, it will revert to its original color when the user is not hovering.
    - Sagittal Plane
        - The information for each interior structure, except for the lobes because they were already explained in the cerebral cortex, will be updated on the bottom right side if viewing on a desktop or beneath the SVG if viewing on mobile.
            - It is reproduced by clicking on each structure.
            - The content displayed should match with the labeling.
        - The structures will change to white (change in state).
            - This is reproduced by hovering over each structure, it will revert to its original color when the user is not hovering.

PART 3

- **Bootstrap**
    - I chose to use this tool because I believe bootstrap is more intuitive than using a CSS grid. Furthermore, with the number of SVGs I used in this assignment, I quickly understood that it was easier to manipulate the organization of the pages to be responsive through bootstrap.
    - I used bootstrap across all of the pages to organize the navigation bar, the main areas of each page, the positioning of the SVGs, and the number of columns they cover to manipulate the sizing.
    - This adds the ability to view the website on a phone, tablet, desktop, and any other sized screen. This allows users to learn this information in a variety of ways, such as on the way to class on a user's phone, or a tablet while taking notes on the user's laptop. The possibilities are endless.
- **Greenstock Animation**
    - I chose to use this tool because I believe this is the best way to represent the learning process I am trying to achieve and it supports complex animations with SVGs. I envisioned that my users would be able to retrieve information easily about a structure or a process and navigate these animations with excitement and clarity.
    - I used this tool to animate all of my SVGs, this includes the neuron on page 1, the graph on page two, the cerebral cortex and sagittal plane on page 3. Additionally, I animated the navigation bar, so all of the titles change color when the user hovers. I used Greenstock animation in conjunction with inline HTML editing to retrieve information for each structure/process dynamically.
    - This animation library changes the functionality of my website completely. Not only was using this library highly intuitive but it was moderately easy to implement and apply across all three pages. It makes the website more interesting and engages users far more through its dynamic nature.

- **JS library- jQuery cdnjs**
    - This tool was used in conjunction with Greenstock animation for all of the features to work as intended. Furthermore, jQuery greatly simplified JS coding, as a result, it was easier to understand and implement this will all of the SVGs.
    - I used it to manipulate the HTML, and color through a combination of both GSAP and the set function.
    - Because it is used in conjunction with Greenstock animation, it provides the same value as described above.

PART 4

I made some significant changes on the brain page from homework 7 to homework 8. I originally intended to use a JS library that contained a 3D brain, that could be rotated to view various structures of the outer part of the brain (cerebral cortex). However, this proved to be quite difficult to implement, so I used interactive SVGs instead and added a section on the interior section of the brain (sagittal plane). Furthermore, I took out the white box that held the text about the various structures on all pages because it was detracting from the overall design. Lastly, I included a landing screen that explains the purpose of the website.

PART 5

I faced many challenges throughout this process, creating and grouping sections of the SVGs in Adobe Illustrator was especially difficult because I had never used illustrator before this project. Furthermore, coding the sections to enable the highlight function and change in the descriptions was very difficult considering that I didn't even understand how to approach this project during the initial stages. I had to watch several videos and consult peers to understand the best way to approach this project. Finally, learning how to use bootstrap was a trial-and-error process that took me many attempts to ensure that everything was positioned as I envisioned it.