Intro to Programming II Report

Question 2

List the modifications and extension that you have made to the template file (400 words).

For each extension your answer should include:

- What is the function of the extension?
- How does the code fit into the templates design?
- How have you structured the extension's code?

1. Sticker Palette
    - This extension allows users to choose and place stickers
    - This extension adds to the stamp tool on the template design, however it adds more customizability and has sliders implemented in the DOM and the stickers are fun
    - The extension's code is structured to read the DOM elements and to dynamically change the image that is used based on the image selected in the options palette.
2. Colour Wheel, Alpha, Stroke, Spread
    - This extension is implemented on all the tools it allows users more choice by giving a colour wheel, and sliders to adjust options like stroke weight, alpha and the spread of the spray can tool
    - Most of the code for this is in the colourPalette.js file, I removed all of the template code for this and made these changes modular.
    - I structured this code so that from anywhere else in the program I can call the colour palette and build the stroke weight, alpha and colour wheel independently from one another and the DOM will be manipulated accordingly.
3. Bucket Tool
    - This tool fills a single colour into a shape. It also allows the user to pick an image and colour it in.
    - This is a new tool.
    - I have structured the extension's code to be as concise as possible and to repeatedly refer to a new array for the pixels to avoid deep recursion.
4. Eraser Tool
    - This is a tool that allows users to erase content.
    - This is a new tool.
    - I have structured the code to just replace the pixels with white (which is the original background colour).
5. Spirograph Tool
    - This is a tool that allows users to make geometric shapes that follow the mouse
    - This is a new tool
    - I have structured the code to draw geometric shapes and adjust their radius according to the x and y coordinates of the mouse.
6. Autodraw Tool

- This allows users to automatically draw geometric lines and connect them and edit their vertices
- This is an extension to the autodraw tool
- I have structured the code to also push premade shapes to the array that temporarily stores the shape details based on selections made in the dropdown box.

7. Paint Tool
    - This mimics a paintbrush
    - It is a new tool
    - It is structured to mix pixels in a watercolour-like way by comparing neighbouring pixels.

Question 3

Describe how effective your plan was in completing your project (250 words). Your answer should include:

- How well did you stick to your schedule?
- Did you divide up the task and the time effectively?
- Did you have an unexpected difficulties or challenges?

- I stuck to the schedule fairly well, although life did get in the way and delayed some of my coding. I found that when I got stuck on a bug it could take days to fix and this would put me behind schedule. I also didn't anticipate that coding clean up and commenting would take so long and the time that I originally allocated to this was just not enough.
- I divided up the task fairly well although some extensions took me longer than anticipated, the bucket tool was incredibly hard to implement and I found my program crashing because of it. I explain in my logs where my hold ups were.
- I had many unexpected difficulties and challenges. I didn't know how to manipulate the DOM effectively at first and found myself writing my html directly in the index.html file, then as the semester continued and I learned more about DOM manipulation I started applying those concepts and made my program much more dynamic. I also didn't fully understand that the p5.js images have to be preloaded. This caused me so much confusion as to why the images I selected on the Sticker palette were not being drawn. Then I realized how to fix it after many days of confusion. Many of my challenges and difficulties can be narrowed down to a lack of experience in the p5.js library and the DOM manipulation. However I overcame these challenges and feel more experiences with these tools now.

Question 4

Evaluate the process of completing the project and how effective the final product is. (250 words)
Your answer should include:

Self evaluation of the process of completing the project.

- You may find it helpful to reflect on your plan and think about what you might do differently next time.

Have you performed any system testing or user testing on your application?

- What errors did you uncover?
- How did users respond to the application?
- How would you rectify these in a future version of the application?

- The final product was effective enough to do what it is supposed to do, however more refining could take place. The bucket fill tool still leaves tiny white spaces between the fill colour and the outline. Personally, I find this infuriating, but I don't have the skills to implement a bucket tool that can fill to this level of detail. I am happy with what I have created and I have learned so much during the development of this tool. I am impressed by my own level of creativity and the things I came up with. Not only did I achieve all the extensions and the tools that I wanted to create, I did more than I initially thought I was capable of. Next time I would plan more time for bug handling and troubleshooting.
- I did perform user testing and I noticed that users that had never used a graphic design tool before did not naturally know what the icons were used for, in general they thought it would be a good tool for the quick creation of art. The users responded very well to my application and I noticed that all of them were having fun creating art, which is what this app was all about.
- In future versions of the application I would add in a tutorial on what the buttons do and even perhaps tooltips on all the buttons to make them easier to identify and understand.

Question 5

List any external sources that you have actively utilised in your project. Your answer should include:

- any code you have used from external sources verbatim
- any code where you have taken inspiration from although adapted and refined for the project (such as pseudocode algorithms or code pens)
- any online help forums you have taken code from (i.e. StackOverflow or library documentation)
- any third-party libraries you have used.

You do not need to include everything you have read or that has helped you. Only where you have used or adapted code that appears in your project. This can be a revised version the answer you provided for the midterm.

I have used several external sources, these are listed in my code as and when they are used:

- https://editor.p5js.org/aferriss/sketches/SJ2UFxy5M
- https://p5js.org/reference/#/p5.Image
- https://stackoverflow.com/questions/63803791/flood-fill-tool-p5-js
- https://www.florin-pop.com/blog/2019/04/drawing-app-built-with-p5js/

These are the sources I got some of my code from, most of the code is adapted to be specific to this project, but this is where a lot of my inspiration has come from.

Paint = https://editor.p5js.org/StevesMakerspace/sketches/d0lPUJt8T

https://editor.p5js.org/StevesMakerspace/sketches/Ezi6W7dwX

Colour Picker =

https://p5js.org/reference/#/p5/createColorPicker

Setting Alpha Properly =

https://stackoverflow.com/questions/47224668/p5-set-fill-color-using-hex-string-and-alpha

Hiding and showing elements in the html =

https://stackoverflow.com/questions/18414384/hide-element-by-class-in-pure-javascript

Making range sliders for the sticker tool =

https://www.w3schools.com/howto/howto_js_rangeslider.asp

Making tables in html =

https://www.w3schools.com/html/html_tables.asp

Clicking an image in html =

http://jsfiddle.net/koldev/6K2bp/

https://www.w3schools.com/jsref/event_onclick.asp

Spirograph =

https://editor.p5js.org/cassie/sketches/9sRtfT9r4

Keeping clicks inside canvas =

https://www.codegrepper.com/code-examples/javascript/check+if+click+is+inside+div+javascript

paint tool getting previous pixels=

```
let d = pixelDensity();
for (let i = 0; i < d; i++) {
  for (let j = 0; j < d; j++) {
    // loop over
    index = 4 * ((y * d + j) * width * d + (x * d + i));
    pixels[index] = r;
    pixels[index+1] = g;
    pixels[index+2] = b;
    pixels[index+3] = a;
  }
}
```

https://p5js.org/reference/#/p5.Image

How the application could look regarding icons:
https://www.freelancer.com/u/mariyapeeva/portfolio/draw-app-p5js-oop-javascript-6448640?w=f&ngsw-bypass=

To create my Favicon for the tab:

https://favicon.io/favicon-converter/

The google font used:

https://fonts.google.com/specimen/Neucha?preview.text=SQUIGGLE&preview.text_type=custom#standard-styles

All of the side icons were taken from:

https://icons8.com/