

INTRODUCTION TO PROGRAMMING II

PROJECT LOG

Project title: Drawing App

Topic: Topic 7 Extending the app

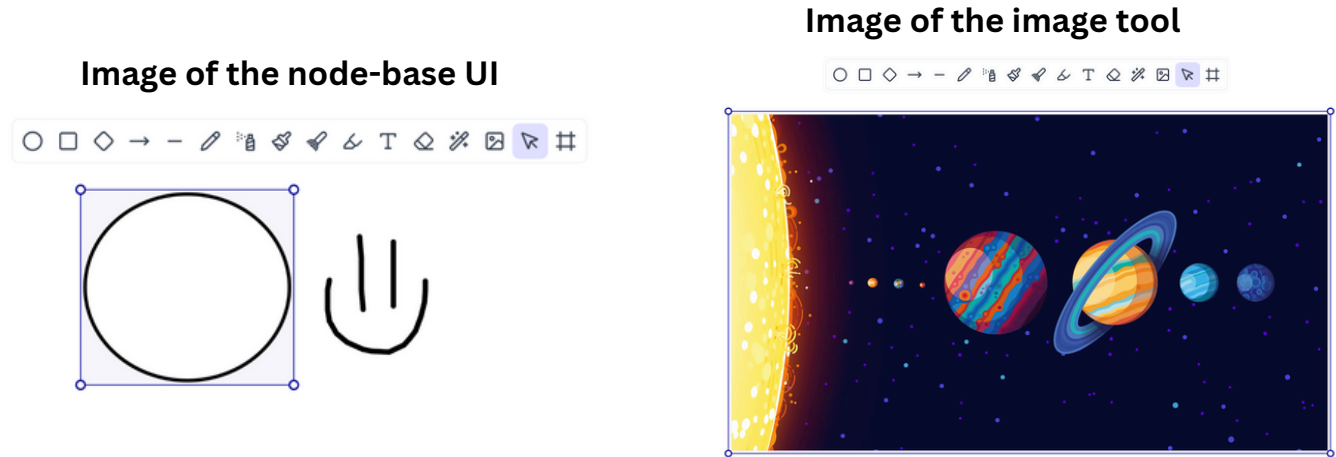
What progress have you made this topic?

For Topic 7, I focused on developing the Node-Based UI and the Image Tool as part of the app's extension, according to my Gantt chart.

Node-Based UI: The Node-Based UI was the first feature I prioritized because it serves as the foundation for the entire Drawing App. This system allows each drawn element, whether it's a circle, square, line, or text, to be treated as a "node." Each node can be individually manipulated—users can move, resize, change the color, background, and other properties of these nodes.

Starting with the Node-Based UI was essential because it establishes the core functionality of the app. By building this system first, I ensured that all subsequent tools and features could be integrated into a flexible and editable drawing environment. The node-based structure acts as the "base" of the project, enabling easy modifications and allowing the app to handle complex drawings with ease. This modular approach streamlines the development process, making future enhancements and tool additions more efficient.

Image Tool: After solidifying the Node-Based UI, I worked on the Image Tool, which allows users to import and manipulate images within the app. This tool also integrates with the node-based system, meaning that images can be treated as nodes—allowing users to resize, move, and modify them just like any other drawn element.



What problems have you faced and were you able to solve them?

I encountered several challenges while implementing the Node-Based UI and other features in the Drawing App, but I was able to overcome them with careful planning and research.

Node-Based UI Optimization: One of the main issues I faced was optimizing the performance of the Node-Based UI. Since all the "nodes" (drawn elements) are stored in an array, the app needs to efficiently handle operations like adding, editing, upserting, and deleting these nodes. The draw function must loop through the array and render the correct elements based on their node type, which required careful optimization to ensure smooth performance. Balancing this processing while maintaining a responsive UI was a challenge. To address this, I focused on optimizing the code, managing memory usage efficiently, and ensuring that the rendering process was as fast as possible. I also implemented unique IDs for each node to track and manage them more effectively.

Selection and Resizing: Another challenge was creating a "selected box" for each element. This box allows users to move and resize the nodes, which added complexity to the UI. I had to write functions that accurately draw these boxes based on the element's position and size, ensuring they interact correctly with the user's actions.

Research: Additionally, I needed to conduct extensive research on p5.js, arrays, objects, and efficient ways to manage dynamic elements within a canvas. This research helped me refine my approach and implement solutions that both improved performance and expanded functionality.

What are you planning to do over the next few weeks?

Over the next few weeks, I plan to implement several new features and tools to further extend the functionality of the Drawing App.

Laser Pointer Tool: One of the main tools I'll be adding is the laser pointer. This is a good idea because it offers a way for users to highlight specific areas of the canvas temporarily without making permanent changes to the drawing. This can be particularly useful for presentations, demonstrations, or collaborative work where users need to guide others' attention to specific details.

Frame Tool: Another important addition is the frame tool. This tool allows users to create a movable and resizable frame around multiple elements, grouping them together so that they can be repositioned or resized as a single unit. This is valuable for organizing complex drawings, making it easier to manage and move multiple objects simultaneously without disrupting the overall layout.

Panning Functionality: I'm also planning to implement panning functionality, which will enable users to move the canvas itself, giving it an "infinite" feel. This will enhance the user's experience by allowing them to navigate larger drawings more easily without being constrained to a fixed canvas size.

Undo and Redo: Finally, I'll be working on adding undo and redo functionality. This feature is essential for any drawing app, as it gives users the ability to easily reverse or reapply changes, improving workflow and reducing frustration when mistakes are made.

Are you on target to successfully complete your project? If you aren't on target, how will you address the issue?

Yes, I am on target to successfully complete my project. After conducting thorough research and carefully planning the next steps, I have developed a clear strategy for tackling the remaining tasks. The work I've done so far, combined with the understanding I've gained of p5.js and the various tools I need to implement, gives me confidence that I can meet the project's goals. By continuing to approach each task methodically, I'm well-positioned to complete the project on time and to a high standard.

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PROJECT LOG

Project title: Drawing App
Topic: Topic 8 Callbacks

What progress have you made this topic?

For Topic 8, I made significant progress by implementing several key features:

- 1. New Tools:
 - **Laser Pointer Tool:** This tool allows users to temporarily highlight specific areas of the canvas, which is particularly useful for presentations and collaborative work where you need to direct attention without making permanent changes.
 - **Frame Tool:** This tool lets users create a movable and resizable frame around multiple elements. This is useful for organizing and managing complex drawings by allowing users to move or resize groups of elements as a single unit.
- 2. Local Storage Functionality:
 - I implemented a system that saves the current drawing progress, including the stroke size, background color, and stroke color, to local storage. This means that users can close the app or reload the page without losing their work. The app will restore the drawing, settings, and canvas background, allowing users to pick up right where they left off without needing to reset preferences every time they use the app.
- 3. Text Tool:
 - I also added a Text Tool, which enables users to add text to their drawings. This tool allows users to change the size, color, and other properties of the text, enhancing the app's functionality and providing more options for creating detailed and personalized drawings.

Image of the laser tool

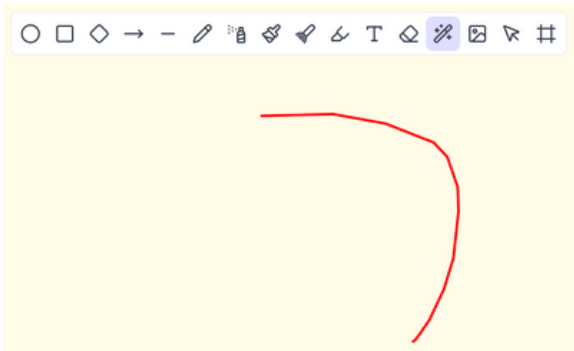
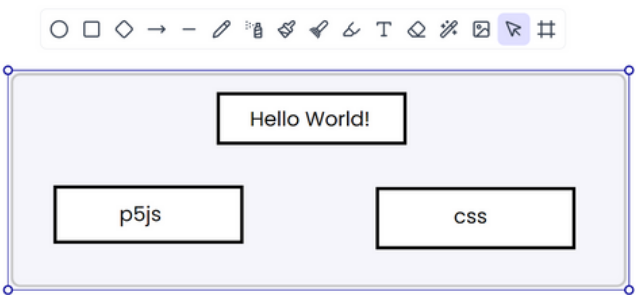


Image of the frame tool and text tool



What problems have you faced and were you able to solve them?

One of the main challenges I faced was managing the different "states" of the Text Tool. The Text Tool involves several interactions:

- 1. **Adding Text:** When a user adds text to the canvas, an input field appears, allowing them to enter their desired text. This step needs to be intuitive and responsive.
- 2. **Editing Text:** If the user double-clicks on the text, the input field reappears, enabling them to edit the existing text. This functionality is crucial for making the app user-friendly and allowing easy modifications.

Handling these interactions effectively required careful management of the tool's state to ensure a smooth user experience. Balancing between adding new text and editing existing text, while maintaining intuitive feedback and responsiveness, proved to be quite challenging.

Despite the complexity, solving these issues was very satisfying. It involved meticulous planning and testing to ensure that both adding and editing text were seamless and that the app's behavior matched user expectations.

What are you planning to do over the next few weeks?

Over the next few weeks, I plan to continue developing additional tools for the Drawing App and addressing any bugs that arise. I aim to implement any new features that come to mind, enhancing the app's functionality and user experience. Additionally, I will focus on creating a context menu that allows users to access various actions through a right-click menu. This feature will provide an intuitive way for users to perform common tasks, streamlining their workflow and making the app even more user-friendly.

Are you on target to successfully complete your project? If you aren't on target, how will you address the issue?

Yes, I am on target to successfully complete my project. So far, I have managed to implement the features I planned without encountering significant problems. I have conducted thorough research and addressed any issues effectively, ensuring that each aspect of the project progresses as intended. With this approach, I am confident in my ability to complete the project on time and to a high standard.

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PROJECT LOG

Project title: Drawing App
Topic: Topic 9 Testing for stability

What progress have you made this topic?

For Topic 9, I have made significant progress in testing for stability and enhancing the Drawing App. As planned, I implemented the context menu, which allows users to perform various actions through a right-click menu, improving the app's usability and accessibility. I also focused on fixing several notable bugs that were identified during earlier stages of development, ensuring a smoother and more stable user experience. Additionally, I created a color picker tool that enables users to select any color they desire, adding greater flexibility and customization options for their drawings. I adapted the Eraser Tool to specifically delete nodes, enhancing its functionality and effectiveness. Furthermore, I introduced a new Spray Can Tool, which adds another creative option for users to explore. These updates contribute to a more robust and versatile application, addressing both user needs and stability concerns.

Image of context menu

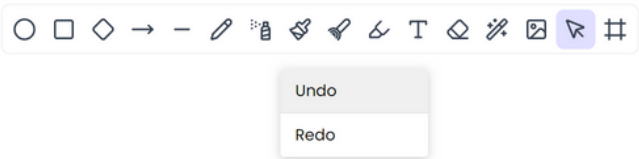
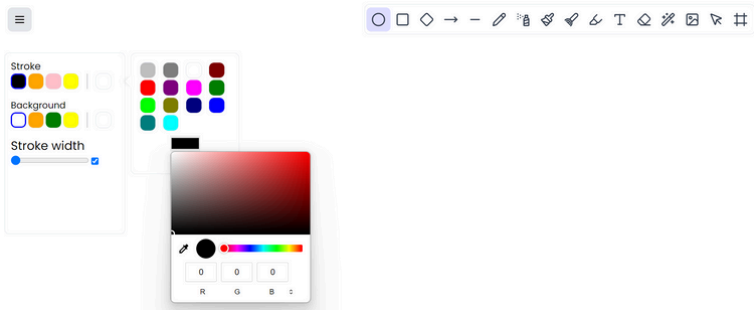


Image of the eraser tool, makes elements transparent when you pass it over them, effectively removing their visibility from the canvas.



Image of the color picker



What problems have you faced and were you able to solve them?

I encountered a few challenges while implementing the features for this topic. Specifically, I had to conduct extensive research to successfully apply alpha transparency to elements when using the Eraser Tool. This process involved about two full days of reviewing p5.js documentation and consulting forums like Stack Overflow. However, I was able to resolve the issue and achieve the desired functionality. Additionally, implementing the context menu required a deep dive into JavaScript mouse events, which also involved some research. Despite these challenges, I was able to address them effectively and make the necessary adjustments. Overall, there were not too many problems, and the solutions I found have contributed to a more stable and functional app.

What are you planning to do over the next few weeks?

As the project moves into its final weeks, I plan to focus on implementing additional tools and addressing any bugs that have emerged from recent changes or that were present previously. I will also work on making the app more modular, improving the readability of the code, and ensuring that it is easier to create and edit the existing functionalities. This will help ensure that the app is not only feature-rich but also maintainable and user-friendly.

Are you on target to successfully complete your project? If you aren't on target, how will you address the issue?

Yes, I am on target to successfully complete my project. Everything is progressing according to plan, and the experience I've gained over the past weeks will enable me to tackle the remaining tasks effectively. With the current momentum and knowledge, I'm confident in my ability to complete the project on schedule and to a high standard.

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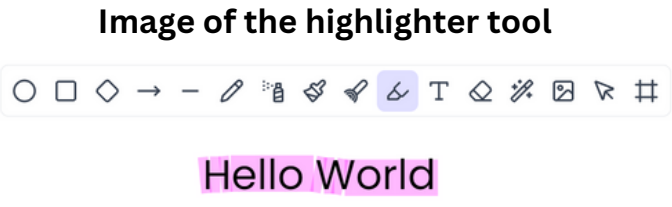
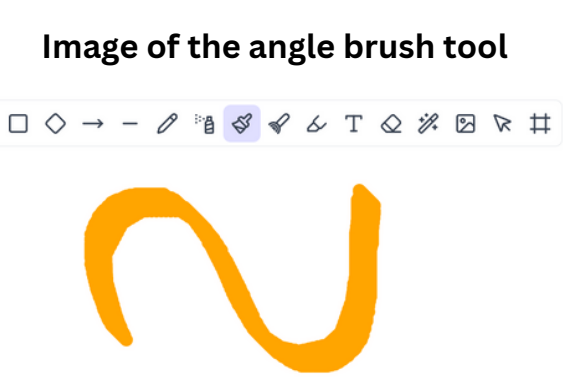
PROJECT LOG

Project title: Drawing App
Topic: Topic 10 Testing with users

What progress have you made this topic?

In Topic 10, I focused on testing with friends (users) and continued to enhance the Drawing App by implementing several new features and improvements. Over the past few weeks, I introduced new tools to enrich the app's functionality. **The angle brush tool** was added, allowing users to apply a brush effect with varying angles, giving more creative control over the texture and style of their drawings. **The rainbow brush tool** was also introduced, which functions similarly to the Freehand tool but applies a rainbow gradient color effect, adding a vibrant and dynamic element to the drawings. Additionally, the **Highlighter tool** was added, enabling users to highlight text and other elements with a semi-transparent color, which is useful for emphasizing important parts of their work.

I also implemented functionality to switch between tools using keyboard shortcuts, streamlining the user experience and making the app more efficient to use. Alongside these new features, I addressed some remaining bugs and focused on making the code more modular. This restructuring improves the maintainability of the code and facilitates easier updates and additions in the future. Overall, these updates have significantly enhanced the app's usability and creative options, setting the stage for further testing and refinement.



What problems have you faced and were you able to solve them?

Since these tools were similar in terms of their internal functionality—dealing with points, objects, and other elements—there were not many issues integrating them with the existing tools. However, during user testing with friends, I did discover a few bugs. These issues were related to how the new tools interacted with the rest of the app and how they performed in various scenarios. I addressed these bugs by carefully reviewing the code and making necessary adjustments to ensure that the new tools functioned smoothly and did not interfere with other features.

What are you planning to do over the next few weeks?

In the final weeks of the project, my primary goal is to complete the remaining planned tools and functionalities. I will focus on ensuring that all features are fully implemented and thoroughly tested to identify and resolve any bugs. This final push will involve fine-tuning the app, verifying its stability, and making any necessary adjustments to ensure that everything functions smoothly and meets the project's objectives.

Are you on target to successfully complete your project? If you aren’t on target, how will you address the issue?

Yes, I am on target to successfully complete my project. Almost all the tools I planned to implement are ready, and the code is well-structured in terms of modularity. There are a few remaining bugs that I need to address before the deadline, but I am confident in my ability to resolve them promptly. Overall, I’m on track to complete the project as planned. 😊

