User Study Results

Our user study was conducted with 20 participants, 5 groups of 4. Each session lasted around 10 minutes and focused on evaluating the usability and intuitiveness of our Google Docs add-on, which visualizes data structures and algorithms from text.

Key findings:

Initial Reactions: Participants liked the concept and felt it would be helpful for coursework. However, several were confused about how to start using the add-on without instructions.

Ease of Use: Participants frequently asked how to trigger visualizations and which data structures were supported. Graphs and Trees, in particular, were difficult for users to input correctly.

Metrics: Usage data showed that Stacks and Queues were easiest for participants to visualize, while Graphs and Trees caused the most trouble.

Suggestions from Participants:

Add a tooltip or quick-start guide

Improve formatting hints

Provide template examples for complex structures like trees and graphs

Include undo/redo features

These observations made it clear that while the concept was appreciated, the user interface needed to be more intuitive and visually consistent.

Revision Plan

Originally, based on the user study report's feedback, we considered multiple feature upgrades (like live formatting feedback and onboarding tooltips). However, after further internal discussion, we decided to focus first on visual consistency and text readability, because users were spending more time confused about layout and interaction rather than feature discovery. Specifically, we prioritized:

- Uniform dialogue box sizes: Ensuring all pop-up boxes (such as BST insertion and preview dialogs) are the same size for a more consistent visual experience.

- Same size for charts and image boxes: Standardize canvas sizes and insert images to avoid abrupt changes in document formatting.

- Text readability improvements: Updating font choices, increasing padding around elements, and balancing color contrast for better visibility and quicker reading.

This approach allowed us to address the most immediate UI discomforts observed during the study, without overwhelming users.

Updates to the UI

The following updates were made based on our revision plan:

- In bstDialog.html, we standardized the canvas size and styling for image previews.

- In bstSidebar.html, input fields and buttons now use consistent padding, border radius, and width for a cleaner layout.

- Font families and sizes were made consistent across dialogs and sidebars, improving appearance and readability.

- Padding was added to dialog boxes and containers so that the boxes would not feel unorganized

- Background colors were standardized, and we made the tool easier to navigate.