

WASHINGTON STATE UNIVERSITY

Description of the SEL Slate Math Equation Editor

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CPTS421 Software Design Project I

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9/24/2020

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PROJECT DESCRIPTION

The SEL Slate Math Plugin allows a user to format symbols to create equations like ones made in the Microsoft Word equation editor within web applications. As existing web-based equation editors lack easy to use interfaces, require memorization of syntax, and are incapable of embedding into text editing frameworks; this project aims to develop plugins that aid in solving this issue. Team Toph will be building upon the current demo developed by an earlier WSU Everett Capstone team that contains the beginnings of said plugin. These changes include converting the project from JavaScript to TypeScript, fixing current bugs, quality of life changes, and adding new features such as the ability to create matrices.

FEATURES

Functionality

An editor using the SEL Slate Math Plugin will allow a user to create and edit equations within web applications. The plugin will also be open source using the MIT license, which allows developers to expand on the product and add functionality in their own products or redistributions of the plugin. The plugin supplies the tools to create the features that a web-based equation editor would require. This includes but not limited to math symbols, ability to make buttons with different functions, drop down utilities for using preset equations, allowing handling, and changing of keyboard shortcuts, an “intellisense” menu when typing \backslash , and rendering.

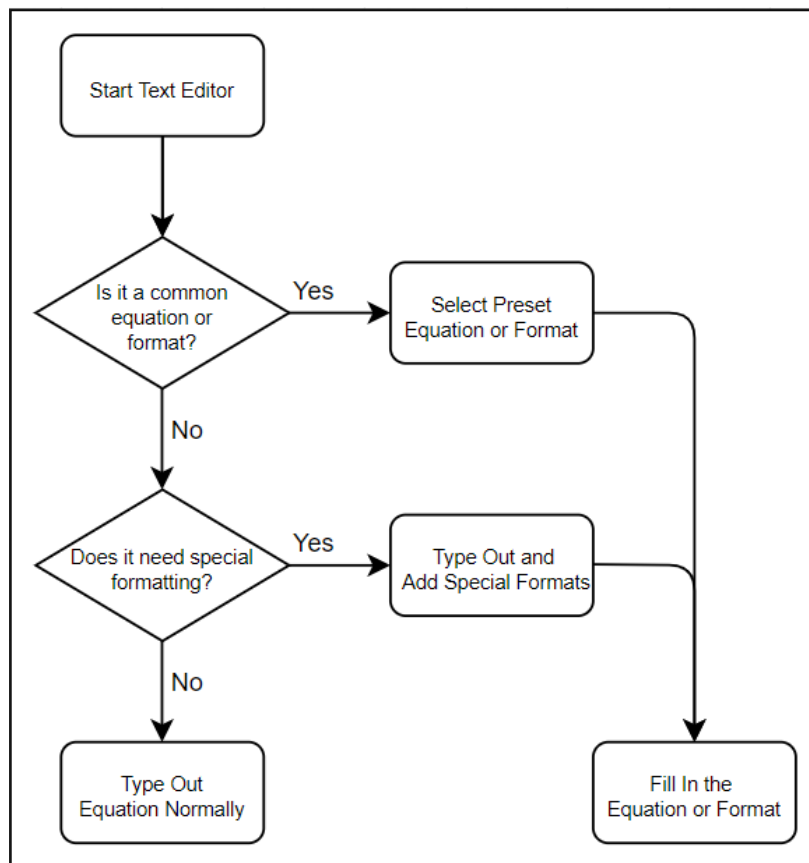


Figure 1. User Functionality

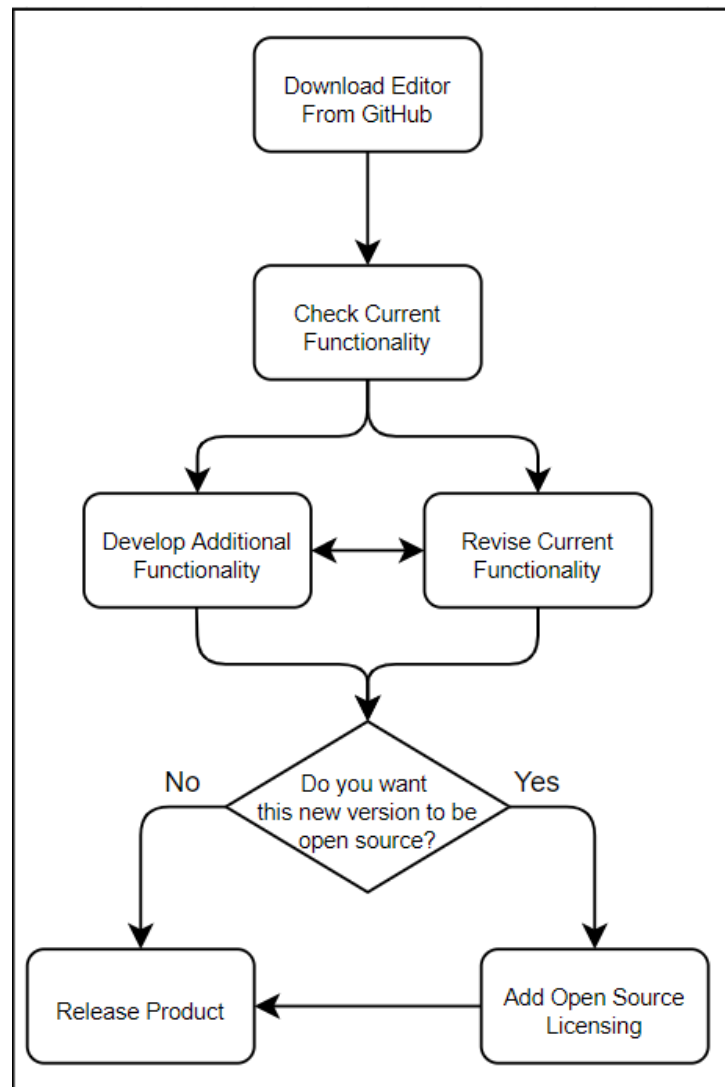


Figure 2. Developer Functionality

Limitations

The specific limitations of the SEL Slate Math Plugin are of the amount preset formats and equations in its final release, this is mostly due to time constraints and potential number of presets.

Current Issues

As this project is a continuation from last year's capstone project there are issues in the code that are currently known. Clearing up the details about these issues with last year's team lead Brandon Le and team mentor Robert Pepka allowed the compilation of them, including short descriptions and even examples:

Table 1. Compiled Issues

[illegible]

RELATED ITEMS

Public/Commercial Domain Packages

A web-based equation editor requires a library that “makes it painless to create interactive UIs” (Facebook, 2020). React is a JavaScript library that allows for building user interfaces. The equation editor will use React to allow for user interaction and keep a focus on ease of use. Implementation of the React library in the plugin is crucial for it to “efficiently update and render just the right components when data changes” (Facebook, 2020). The plugin keeps a focus on readability and being user friendly with quick and efficient text and graphic updates. React’s focus on interactive UIs and efficient rendering is necessary to the editor.

The equation editor embedded in Microsoft Word runs parallel to the online equation editor. MS Word includes features that the plugin will mimic such as allowing for pre-built common equations to select from a drop-down menu (Microsoft, 2020). Reviewing MS Word's equation

editor and piggybacking off their flow, the plugin design will follow Microsoft's professional standard. Reviewing similar and competing programs ensures that online equation editors using the plugin will be up to par. The plugin will allow editors to implement features that mimic MSWord's functionality.

STAKEHOLDER ISSUES

Identification & Considerations

The stakeholders of the Slate Math Plugin, beyond the client and team members, are end-users, developers, and competitors. The end-user stakeholders are the ones that will use the plugin. Developer stakeholders are the ones who work on the code to improve, or to implement it into other platforms. The Slate Math Plugin may influence competitor stakeholders.

The end-user stakeholders are the ones who will ultimately use the Slate Math Plugin. These end-users include, but not limited to, schools, engineers, writers, businesses, and the government. Schools use the Slate Math Plugin to create assignments, and worksheets. Engineers and writers use the plugin for writing, textbooks, manuals, and documentation. The government uses the plugin for legal documents. Businesses use the plugin for accounting, marketing, and management. A user-friendly design and properly implemented plugin can save time and help increase productivity. The inclusion of presets and templates would also increase the ease of use and productivity. A non-user friendly or improperly implemented Slate Math Plugin could result in inaccurate documents, textbooks, assignments, manuals, and legal papers.

The code for the Slate Math Plugin is an open source code using the M.I.T. license. The M.I.T. license allows the developer stakeholders to do anything they want with the code. However, if developer stakeholders redistribute it in code form, they must include this copyright notice. In addition, they would also release any rights to hold the authors liable in the event something goes wrong using it. A positive impact of an easy to read code is that the developer stakeholders have a better opportunity to understand the current code. Organized code with ample comments and documentation will positively affect the developer stakeholders. A poorly designed code without comments could hinder the developer stakeholder's ability to read and improve the code.

The Slate Math Plugin has the capability to, directly or indirectly, affect the performance of its competitors. A positive or negative impact for the competitors is if the Slate Math Plugin's design allows more features and is easier to use. As a positive impact, the competitors could potentially incorporate features from the Slate Math Plugin into their own product. As a negative impact, the Slate Math Plugin has the potential to replace a competitor's product.

Project Schedule Overview

Legend:

- Task:** Blue bar
- Inactive Summary:** Blue bar with dots
- Split:** Diamond symbol
- Milestone Summary:** Diamond symbol
- Project Summary:** Diamond symbol
- Inactive Task:** Diamond symbol
- Inactive Milestone:** Diamond symbol
- External Task:** Grey bar
- External Milestone:** Grey bar
- Question-only:** Green bar
- Outdate:** Green bar
- Progress:** Green bar
- Manual Summary Rollup:** Green bar
- Manual Progress:** Green bar
- Start only:** Blue bar
- End only:** Blue bar
- Task-only:** Blue bar

Project Details:

- Project:** SEC-Equation-Editor
- Date:** Fri 9/25/20

Timeline:

- 1. Finish Learning Languages/Libraries:** Sep 27, 2019 - Oct 4, 2019
- 2. Code Review & Tech Spec/Software Regs:** Oct 11, 2019 - Oct 18, 2019
- 3. Code Work:** Oct 25, 2019 - Nov 1, 2019
- 4. Demo and Testing:** Nov 8, 2019 - Nov 15, 2019
- 5. Code Work:** Nov 22, 2019 - Nov 29, 2019
- 6. Writing Alpha Report:** Dec 6, 2019 - Dec 13, 2019

WORKS CITED

Abramov, Dan. "React." *GitHub*, Facebook, 8 July 2020, 10:30 AM PDT, github.com/facebook/react.

"Write an Equation or Formula." *Office Support*, Microsoft, support.microsoft.com/en-us/office/write-an-equation-or-formula-1d01cab1-ceb1-458d-bc70-7f9737722702.