# ***Google Summer of Code 2025 Proposal***

***Project Title:*** *Maintaining and Enhancing the VS Code AsyncAPI Preview Extension*

## ***1. Personal Information***

* ***Full Name:*** *[Your Full Name]*
* ***Email:*** *[Your Email Address]*
* ***GitHub:*** *[Your GitHub Profile URL]*
* ***LinkedIn:*** *[Your LinkedIn Profile URL]*
* ***IRC/Discord Handle:*** *[Your Handle]*
* ***Location:*** *[Your City, Country]*

*Please refer to my attached resume for further details regarding my education and project experience.*

## ***2. Synopsis***

*The AsyncAPI Preview extension for Visual Studio Code is an essential tool for developers working with AsyncAPI specifications. However, it currently suffers from lack of maintenance, outdated features, and insufficient validation capabilities. This project will revamp the extension to improve its stability, introduce Spectral linting enhancements, add autofix capabilities, and provide better logging and debugging mechanisms. Additionally, I will establish sustainable practices to ensure ongoing maintenance.*

***[Insert VS Code AsyncAPI Preview Extension Screenshot Here]***

## ***3. Problem Definition & Motivation***

### ***3.1. Current Challenges***

* ***Lack of Active Maintenance:*** *The extension requires regular updates, issue triaging, and feature improvements.*
* ***Developer Experience:*** *Developers depend on real-time AsyncAPI visualization and validation, demanding better performance and new capabilities.*
* ***Spectral Linting & Autofixes:*** *Currently, validation feedback is limited, and no autofix suggestions are available for common issues.*

***[Insert Validation Issue Example Image Here]***

### ***3.2. Motivation***

*This project will:*

* *Provide a better development experience by introducing real-time validation with actionable feedback.*
* *Improve code maintainability and stability through refactoring and optimized performance.*
* *Establish sustainable maintenance practices to support the AsyncAPI community long-term.*

## ***4. Proposed Solution***

### ***4.1. Improve and Maintain the Extension***

* *Review and refactor the codebase for stability and performance.*
* *Enhance the user experience by optimizing the rendering and validation processes.*

### ***4.2. Enhance Spectral Linting & Validation***

* *Support custom Spectral rules for AsyncAPI validation.*
* *Implement autofix suggestions for common linting errors.*

### ***4.3. Improve Logging & Debugging Capabilities***

* *Provide enhanced logging for error diagnosis.*
* *Display clear error messages and actionable feedback to users.*

***[Insert Error Logging Example Image Here]***

### ***4.4. Ensure Long-Term Sustainability***

* *Actively triage and resolve GitHub issues.*
* *Improve documentation for contributors and users.*
* *Establish automated deployment workflows.*

## ***5. Project Goals & Deliverables***

### ***5.1. Project Objectives***

* *Maintain and refactor the extension’s codebase for improved performance and stability.*
* *Implement robust Spectral linting and autofix functionality.*
* *Introduce comprehensive logging and error-reporting mechanisms.*
* *Develop detailed contributor documentation and deployment guidelines.*

### ***5.2. Deliverables***

* *Improved extension with Spectral linting and autofix support.*
* *Refactored and optimized codebase.*
* *Enhanced logging and error management features.*
* *Documentation for users and contributors.*

## ***6. Technical Approach***

* ***Languages & Frameworks:*** *TypeScript, JavaScript*
* ***Platform:*** *Visual Studio Code API*
* ***Linting Tool:*** *Spectral*
* ***Testing & Debugging:*** *Jest, Mocha*
* ***Version Control:*** *GitHub*
* ***CI/CD:*** *GitHub Actions*
* ***Logging:*** *Custom error handling with enhanced logs*

## ***7. Timeline***

| ***Phase*** | ***Duration*** | ***Tasks*** |
| --- | --- | --- |
| *Community Bonding* | *Weeks 1–2* | *Familiarize with the codebase, engage with the community, and finalize project goals.* |
| *Codebase Refactoring* | *Weeks 3–4* | *Identify inefficiencies, refactor code for maintainability, and improve performance.* |
| *Spectral Linting Implementation* | *Weeks 5–6* | *Integrate Spectral linting, implement custom rules, and perform initial testing.* |
| *Autofix Feature Development* | *Weeks 7–8* | *Develop and integrate autofix suggestions for common linting issues.* |
| *Logging and Debugging* | *Weeks 9–10* | *Implement detailed error logs, enhance error messages, and improve debugging capabilities.* |
| *Documentation & Guidelines* | *Weeks 11–12* | *Create user and contributor documentation, add examples, and write troubleshooting guides.* |
| *Testing & Final Improvements* | *Weeks 13–14* | *Conduct extensive testing, resolve bugs, and incorporate feedback from the community.* |
| *Final Polishing and Submission* | *Weeks 15–16* | *Perform final testing, polish the implementation, and submit the final project report.* |

## ***10. Workflow***

***[Insert Workflow Diagram Image Here]***

1. ***Requirement Analysis:***
   * *Understand user pain points and gather feedback.*
2. ***Codebase Exploration:***
   * *Analyze the existing code and identify areas for improvement.*
3. ***Development:***
   * *Implement features in phases, ensuring functionality and usability.*
4. ***Testing and Debugging:***
   * *Perform unit, integration, and user acceptance tests.*
5. ***Documentation:***
   * *Write clear documentation for both users and contributors.*
6. ***Deployment:***
   * *Ensure CI/CD pipelines are properly configured for releases.*

## ***14. Conclusion***

*This project is an opportunity to enhance a critical tool in the AsyncAPI ecosystem. I am committed to delivering meaningful improvements, collaborating with the community, and ensuring the long-term success of the extension. Thank you for considering my proposal.*

*I look forward to the opportunity to contribute to AsyncAPI and make a lasting impact!*