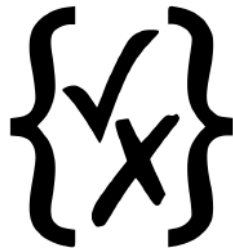# JSON Schema

Build more. Break less. Empower others.

Proposal for GSoC 2024

Building JSON Schema Language Toolings

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- **Languages**: English, Hindi

Declaration: There is **NO** use of Generative AI such as Gemini, ChatGPT etc. Google Docs proofread feature is used.

Why I've chosen this project & JSON Schema as my Organisation.

Quick Story: My father bought our first computer when I was born, so eventually I have grown up spending a lot of time on screen. Over the time, I have used so many open source projects and therefore I am a huge fan and advocate of the work and building tools that just make people's lives easier.

Background: So, when I faced some friction while surfing the web, I started to build my own tool **"Toppings"**, which is a browser extension and I started to learn specific technologies to build my project but I have no experience working in open source so each time I learned something I started to indulge myself in open source projects to better grasp on a bigger codebase.

Motivation: I believe JSON Schema is an organisation that strongly resonates with my beliefs and ideology. The hard work by the team enables a lot of users to work with JSON without any hassle. Moreover, the time I have been there; everyone has been very welcoming, supportive and motivating to drive my desire to improve and work.

TLDR; I desire to learn from experienced open source projects, to build and improve helpful tools while giving back to the community.
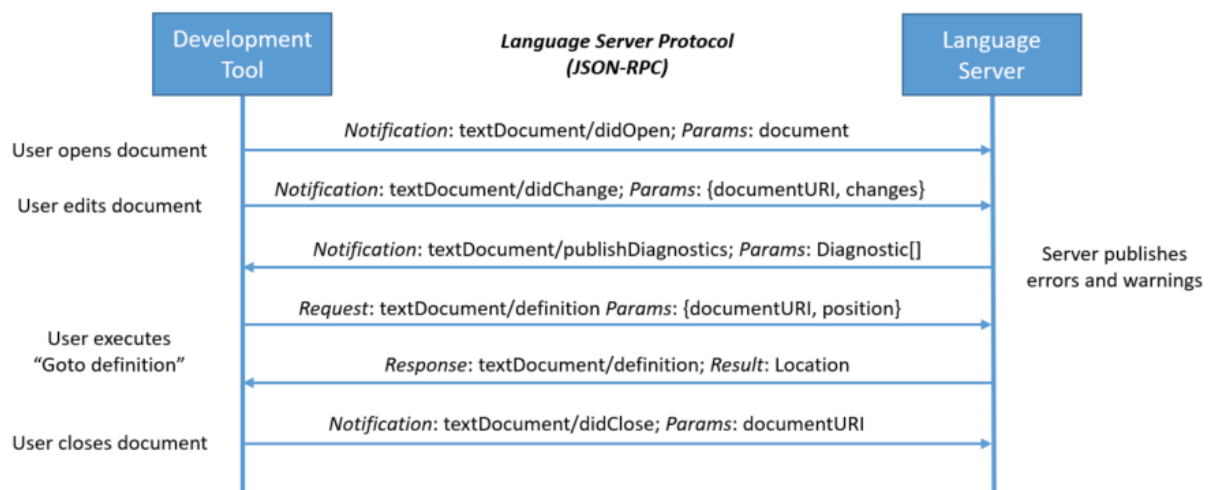
Project Description:

Name: JSON Schema Language Server Contributions

Mentor: @jdesrosiers

Goal: The JSON Language Server that's built-in to VSCode does have JSON Schema support, but it doesn't support recent versions of JSON Schema and is missing support for some features in the versions it does support. There will be a prioritised list of tasks and I will work with the maintainer to complete as many tasks as I can in the time allotted for GSoC. Tasks may include implementing a language server feature, adding linting rules, improving an existing feature, and possibly some bug fixes.

TLDR; Collaborate with the mentor to contribute to the language server with various areas of focus and contributions.

Language Server Protocol

Academic Knowledge:

I am currently a final-year Computer Science and Engineering undergraduate at Sant Longowal Institute of Engineering and Technology, India. I am enrolled in a 4 year B.E. (Bachelors in Engineering) program. **I'll graduate later this year, therefore I will be available during the GSoC contribution period.**

The following is a list of relevant courses I have completed from credible online course providers that have given me a deep understanding and hands-on experience required for this project:

- [JavaScript - The Complete Guide 2024 (Beginner + Advanced)](#)
- [Understanding TypeScript](#)

Projects & Prior Experience:

- **[Toppings](#)** - Toppings is a browser extension. I recognized that certain features were missing from the default web experience, so decided to develop Toppings to fill that gap. **Similar to mentor's vision to build with spike indulging into an unknown territory, I learned to build browser extensions from scratch.** *Currently, I am actively working on a major update to v2.*

- **[Toppings Website](#)** - This website is built using SPA React. The primary goal is to showcase and promote my tool **"Toppings"**.
  With v2, I plan to migrate this to the latest App Router Next.js to improve the SEO and enable web crawlers for a better ranking.

- **[Personal Blog](#)** - This is currently ***work in progress*** and as of now contains fake lorem ipsum text. I hope to publish my experiences as part of my GSOC journey and other projects I will work on. Using popular technologies such as Next.js & R3F to gradually build a 3D interactive portfolio to showcase my web abilities.

Existing Contributions to JSON Schema:

Currently, in my time at JSON Schema during pre-GSoC time period. I have actively contributed to JSON Schema and existing language server tools as mentioned below:

1. [Fix Module Not Found Error](): The previous VSCode build was using a temporary hack to run the language server due to a MODULE NOT FOUND error in the bundled output. The PR aimed to resolve this issue by fixing how the module was imported in the bundle. While the PR was reverted, it did lead us towards a better solution.

2. [Fix Empty Document Errors](): While working on the qualification task, we stumbled upon the issue causing the language server to crash on an empty document. In collaboration with my pair partner, we hosted a meet to fix these errors and incorporate the fix with a PR.

3. [Post Install Script](): Previously, during the development phase we had to run npm install scripts into each of the directories manually which was unnecessary, redundant and ineffective. This PR aimed to add a script to the root package.json to centralise npm install.

4. [Add Hover Provider Feature](): As part of the qualification task, I actively collaborated with my pair to discuss, determine the direction and iterate over our approach to implement the hover provider feature.

5. [TeamWork & Collaboration](): In addition to discussed Language Server contributions, I participated in teamwork and discussions to collaborate with multiple contributors to work on the JSON Schema website.

Proposed Contributions and Timezone Management:

While building a language server is an overwhelming task, it is also an exciting opportunity to learn communication, designing, decision making and asynchronous collaboration on a large project.

I have a positive attitude towards learning and problem solving to overcome challenges and complexities. I have consistently proven to solve existing unsolved problems in the project & follow up with a PR.

I wish to explore and better understand our scope to refine, iterate and build this complex language tooling ecosystem. I accept making mistakes, getting criticism, change and learn to be part of determining the direction of the project as we go.

Proposed Contributions:

- **JSON Schema Icons**: We could implement the VSCode theme UI guide to integrate the JSON Schema logo as the file icon for `.schema.json` files. There are also popular existing file icon extensions that we can refer for a better understanding such as Material Icon.

- **CLI Tools**: The language server tools could be leveraged to support a CLI tool to analyse the project. Since we already have an extension we could leverage VSCode command palette to build commands to execute various features such as linting similar to ESLint and TypeScript commands.

- **Package to a VSIX file**: Discuss and fix the complexities to add a script (npm run package) for packaging the extension into a VSIX file that can be used to install the extension in VSCode.

- **Linter**: While I understand that this is another challenging task within an already quite complex project, it's equally rewarding. Today, linting is one most common and expected tooling in every ecosystem.

  Currently, I am unknown to the world of building a linter but I would love to try, given my excitement and history to learn and explore new and complex topics.

- **Test-Driven Development**: We should also gradually start to rewrite the existing codebase and introduce a TDD approach to ensure reliability and make future contributions easier and finish migration before the scope of the projects grows too large.

- **Add Typescript Support**: During the re-write and implementation with TDD approach, I suggest migration to TypeScript. This will introduce type safety, improve maintainability.

Timezone Management:

I understand the time zone difference poses a challenge. I propose the following ensuring collaboration despite the timezone difference:

- **Working around Mentor's Timezone**: With my existing habit of working late nights during my college years, I'm fully flexible to adapting my working hours to ensure overlap with the mentor's availability.

- **Scheduled Syncs**: Have frequent and dedicated meetings to work closely with the mentor. I'm flexible on timing (early mornings or late evenings my time if needed).

- **Proactive Updates**: Regular updates on Slack, or any other preferred communication channels to share progress and address any challenges.

What do I expect from participating in GSoC?

I am very passionate about the tools and programs that I am currently building and plan to build in the future. To build them effectively I aspire to learn various aspects of building, maintaining open source projects and industry standards and practices from this community of experienced and talented members.

In addition, I wish to connect and gradually be a part of this welcoming community and hopefully, eventually someday become a mentor for GSoC in coming years.

Lastly, up until now I have been working by myself with no experience working in a team or organisation setup. Participating in GSoC would offer me the opportunity to gain this experience. This is a wonderful learning opportunity and would also help build my work experience, to possibly showcase my abilities for any future work opportunities after the GSoC period.

TLDR; Learn from experienced community members, become a part of the community, possibly even become a future GSoC mentor.

Timeline:

Time Commitment:

During GSoC's 12 week timeline, I would be able to devote ~48 hr/week to ~60 hrs/week with the flexibility to increase if the need arises.

Community Bonding:

In my time contributing to JSON Schema during the pre-GSOC time, the team and mentors have been extremely supportive and encouraging. The positive and welcoming attitude of the entire community keeps me motivated and a smile on my face.

Given my existing familiarity and bonding with the community, I wish to get more involved and socially engaged with the project. In addition, I plan to start writing about my learnings during the pre-GSOC phase and as a contributor through blog posts during the entire period about my experiences.

Lastly, this will be followed by finishing any formal requirements such as the filing tax forms required by Google, any contributor licence agreements, and any paperwork that the project requires.

Given the open ended nature and prioritised tasks by the mentor are yet to be discussed. Following is a proposed timeline outline of my proposed contributions. This can be easily updated to accommodate the priority tasks by the mentor.

- **Week - 1:**
  - The first step before starting to work on the issue is to review the discussion and capture the last requirements.
  - Discuss with the mentor to iterate on proposed contributions and project scope.

- **Week - 2, 3:**
  - Followed by implementing the VSCode theme UI guide to integrate the JSON Schema logo as file icons.
  - We would experiment with existing file icon extensions and gather insights for implementation.

- **Week - 4, 5:**
  - Discuss and address complexities in packaging the extension into a VSIX file.
  - Develop a script (npm run package) for easy packaging and installation in VSCode.

- **Week - 6, 7:**
  - Gradually start to migrate TypeScript into the project to enhance type safety and maintainability.
  - Start the process of rewriting the existing codebase with a focus on implementing a test-driven development approach.

- **Week - 8, 9, 10, 11:**
  - Start by researching and learning about building a linter.
  - Then, explore existing linting tools and libraries for inspiration and understanding.
  - Begin implementation by working to create an AST that represents a schema.
  - Followed by implementing methods to check which properties are keywords.
  - Followed by an initial implementation of linter with configuration rules and options specific to JSON Schema validation.
  - Test the linting against various JSON Schema documents to validate its functionality and accuracy.

- **Week - 12:**
  - Take community and mentor feedback to ensure all deliverables meet requirements and quality standards.

- **Week - 13:**
  - Spare week to address any remaining feedback, refinement or in case of some work getting delayed possibly due to some emergency or otherwise.

Acknowledgement: While making the proposal, I have taken the reference from the 2023 GSoC Proposal made by Priyanshu Sharma.