Implementation section

Resources used

To accelerate the project's development, we leveraged the benefits of various existing libraries. In particular, we utilized the following libraries:

* Antlr4: For the crucial initial processing of the JSON files. Specifically, for its lexer and parser components, which were instrumental in creating a parse tree from the input JSON files.
* FreeTTS: For the ReadAloud functionality of the tool, which enabled users to have the generated natural language descriptions read aloud.
* Picocli: For implementing the tool as a Command Line Interface (CLI), making it easier for users to access and operate the tool. By utilizing these libraries, we were able to expedite the development process, enhance the tool's functionality, and improve the overall user experience.

ANTLR4 played a critical role in implementing the JSONTalk tool by providing a powerful parser generator that allowed us to construct a parse tree from the input JSON file. Utilizing ANTLR4's grammar syntax, lexer, and parser, we were able to extract the syntactic structure of the input and produce an accurate representation of the data. The subsequent use of a Visitor implementation to traverse the parse tree and generate natural language descriptions of the input added significant value to the tool's functionality. ANTLR4's customizable features and reliable performance enabled us to parse the JSON input with precision and efficiency. The use of the Visitor design pattern in combination with ANTLR4 provides a flexible and extensible approach to processing complex data structures.