Audio description for JSON

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Proposal

Motivation

There aren't many tools available for visually impaired programmers to understand the structure of code, they are restricted to the line-by-line reading of code using a screen reader. The tool I am building seeks to allow programmers to enter a JSON file and gain a greater understanding of the overall structure of the file, without having to read the whole thing with a screen reader. This tool will ***save time*** *and* ***improve understanding****.*

Aims

This project aims to build a command line tool that can be run with different arguments to produce different descriptions of JSON files with different levels of detail.

Progress

- Chosen a parser generator tool, development language and development environment.
- Undertaken user study for requirements gathering: gathered individual JSON descriptions from several programmers to gain a further understanding of how the files are understood.
- Researched existing tools available for structural descriptions of code.
- Researched how to implement Text To Speech software.
- Successfully built a JSON parser using the ANTLR4 framework that generates description of any JSON file.
- Generated an audio description of the description of the file using text to speech tools.

Problems and risks

Problems

- Audio description speech is not of sufficient quality.
- The command line tool part of the project has not been implemented.

Risks

- Ensuring that understandability of the code is maximized for larger files. Mitigation: need to test on larger files to understand the impact of this. Will possibly develop a limit on description size, and reduce detail of description if this limit is breached.
- Visually impaired software engineers are quite a small group. Evaluating the product with realistic end users will be difficult. Mitigation: evaluation could take place with sighted software engineers, this method has been used by other research papers.

Plan

- Week 1: Develop command line interface

Deliverable: command line interface with suitable options

- Week 2: Evaluation research and testing
    - Deliverable: Test cases written, notes on evaluation research
- Week 3: Evaluation plan and formal literature review write up
    - Deliverable: Formal evaluation plan and first draft of lit review
- Week 4: Evaluation recruitment and finish lit review write up
    - Deliverable: List of participants for evaluation, and 2nd draft of lit review
- Week 5: Evaluation implementation
    - Deliverable: Finished evaluation results
- Week 6: evaluation results analysis
    - Deliverable: points for product improvement
- Week 7: polish product in line with evaluation results
    - Deliverable: improved product
- Week 8-10: Dissertation write up
    - Deliverable: first draft submitted to supervisor 2 weeks before deadline