

Refactoring

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Short description

The task is to implement and research refactoring for the ABS programming language [3].

Background and motivation

Refactoring is the process of changing a software system in such a way that it does not alter the external behavior of the code yet improves its internal structure. In essence when you refactor you are improving the design of the code after it has been written.[2]

The thesis will be based around implementing refactoring support and researching refactorings for the ABS programming language. We want to offer users of the language more refactorings and a satisfactory method to apply them. To do this we will build upon an existing Xtext grammar^[1] and work with the LSP protocol^[4]. A proposal to extend the LSP protocol might be made in order to accomplish this goal. With this as a basis, the temporary thesis statement and research questions will be

- How should refactoring be implemented for ABS?
- Is the resulting approach generalizable to other programming languages?
- Which refactorings can we safely implement?

Methodology

The thesis will consist of both theoretical and practical work. The theoretical work will consist of reading relevant existing research and conceptualizing refactorings. The practical work will consist of implementing software which will provide these refactorings. That will be a process of specifying requirements for the software, implementing the software and then evaluating if the software meets the requirements.

References

- [1] Eclipse. *Xtext*. <https://www.eclipse.org/Xtext/>. 2021.
- [2] M. Fowler. *Refactoring: Improving the Design of Existing Code*. Boston, MA, USA: Addison-Wesley, 1999.
- [3] E. B. Johnsen et al. “ABS: A Core Language for Abstract Behavioral Specification”. In: *Formal Methods for Components and Objects - 9th International Symposium, FMCO 2010, Graz, Austria, November 29 - December 1, 2010. Revised Papers*. Ed. by B. K. Aichernig, F. S. de Boer, and M. M. Bonsangue. Vol. 6957. Lecture Notes in Computer Science. Springer, 2010, pp. 142–164.
- [4] Microsoft. *Language Server Protocol*. <https://microsoft.github.io/language-server-protocol/>. 2020.