Experiments in Programming Language Extension

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The extension of an existing programming language through the addition of additional "features" is a process fraught with potential problems. Additional features must be integrated smoothly into the existing language framework at the syntactic and semantic levels and this invariably requires a thorough (re)analysis of many aspects of the programming language, including the syntax, the type system, the definitional semantics, the intermediate representation, and the runtime model.

In this project, I will analyze an existing experimental programming language, propose extensions that substantially and meaningfully extend the capabilities of the language (including the introduction of aggregate types and object-oriented features into this non-objected-oriented language), and integrate these changes into the scanner, parser, typechecker, code generator, and definitional interpreter for the language. The necessary work will require both theoretical work with the mathematicological aspects of the language's specification and practical work with the existing processors for the language.

Readings

- [Zaring2017] Zaring, Alan, *The Revised Revised Revised Revised Revised Report on CCL: A Subject Language for Compiler Projects* (unpublished manuscript)