Koffect

Context-oriented Programming Language

Team

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Project Abstract and Goal

Koffect is a research language that explores the realm of context-oriented programming focusing on its applications to general purpose programming. This innovative project seeks to address the inherent challenges posed by implicit contexts in programming, ranging from code correctness to resource management to the creation of domain-specific languages. Koffect takes inspiration from many languages with similar features such as algebraic effects/coeffects (OCaml, Effekt, Koka, Eff), implicit parameters (Haskell), and context parameters/context receivers (Kotlin, Scala). By doing so, Koffect aims to build on the strengths of these languages while innovatively addressing the challenges associated with context management in programming.

Milestones

Research

- Extensive research into programming languages improved overall design and design cohesion
- Documentation of language evolution over time

Implementation

- Implementation of core compiler subsystems for initial proof of concept

Language Channel

- Creation of #koffect channel in r/ProgrammingLanguages Discord server to foster a language community

Challenges

Cohesive Design

- To ensure a cohesive yet flexible design, research into programming language theory and development was needed
- Balancing cohesion with flexibility proved tougher than anticipated

Scope Creep

- Initial time estimates were underestimated
- Unforeseen setbacks during design and implementation

Future Work

Building a language is very complex and takes time. This project is planned to be continued post-graduation with the following goals:

- Compiler Implementation
  - Type Inference, Build system, Multiplatform story, LSP
- Language Evolution
  - Asynchronous story, Standard Library story
- Language Community
  - Continue to cultivate language community through Discord and expand to other social medias

Design Diagram