Y790-32707 - Assignment 4: Flow Techniques

Caner Derici

1 General Audiance - OLD

To understand certain behavioral changes under different effects, the scientific principle of experimentation applies to the computer software as well. The story of executing a program on a computer starts with a human readable code in a certain programming language. That code needs to be translated by another program, namely a compiler, into another representation that a machine can read and execute. We are working on a just-in-time (JIT) compiler, namely Pycket, for the Racket programming language. Given a program written in the Racket language, Pycket translates it to a representation that will be evaluated in later phases again by Pycket to produce the final result.

Alternatively Pycket could use the machine representation produced by Racket's own compiler instead of manually creating one to proceed to the final result. Since the Racket's compiler is designed exclusively for Racket, the representation produced by it is highly optimized. The aim of our study is therefore to modify Pycket to use the alternative representation to find out the effects of the certain optimizations that are performed by Racket's compiler to the overall performance of Pycket. As a consequence, this will allow us to understand better the individual effects of distinct optimizations to the performance of JIT compilers in the general case.

2 General Audiance - NEW

The story of executing a computer software starts with a human readable code in a certain programming language. This software code needs to be translated by another software, namely a compiler, into a type of code that a machine can read and execute. We are working on such a compiler, in particular a just-in-time (JIT) compiler named Pycket, that translates software written in the Racket programming language. Given a software written in Racket, Pycket translates it to a type of code that can be read and executed in later phases to produce the final result.

Instead of translating the human readable software in Racket language, Pycket can be modified to translate machine readable code produced by Racket's own compiler, which is exclusively designed for Racket. Thus Pycket can translate a highly optimized version of the Racket software, which was originally untouched in its human readable form. The aim of our study is therefore to modify Pycket to translate the optimized Racket code and compare the performances of the two versions of Pycket. This will reveal the effects of the Racket optimizations to the overall performance of Pycket. As a consequence, this will also allow us to understand better the individual effects of the distinct compiler optimizations to the performance of JIT compilers in general.

3 Book Exercise

Palace revolts and popular revolutions plagued seven out of eight reigns of the Romanov line after Peter the Great. In 1722, Peter terminated the principle of heredity, and made achievement by merit the basis of succession. This resulted in many tsars not appointing a successor before dying, including Peter. Succession not dependent upon authority resulted in the boyars' regularly disputing who was to become sovereign. Czarina Anna appointed Ivan VI, who was less than two months old, but Elizabeth, the daughter of Peter the Great, defeated Anna and ascended to the throne in 1741. Paul I codified the law of succession in 1797 to be male primogeniture. However, conspirators strangled him, one of whom was probably his son, Alexander I.