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Assignment of master's thesis

Title:	Understanding Feedback Pollution in the R Programming Language
Student:	Bc. Filip Říha
Supervisor:	doc. Ing. Filip Křikava, Ph.D.
Study program:	Informatics
Branch / specialization:	System Programming
Department:	Department of Theoretical Computer Science
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Instructions

Understanding Feedback Pollution in the R Programming Language

The heart of just-in-time compilation is the ability to specialize functions based on past behavior.
By recording information about types, callees, or control flow, a JIT compiler can generate efficient native code even for highly dynamic programming languages. However, the recorded feedback tends to become less precise over time, impacting the code quality and, in turn, performance. This thesis aims to study this phenomenon known as feedback pollution in the scope of the R programming language and explore ways to reduce it.

Tasks:
- Get familiar with Rsh, the JIT compiler developed at the PRL laboratory at FIT.
- Implement a tool for gathering data about feedback recorded by the VM.
- Explore how feedback behaves, how pollution occurs, and how to reduce it.
- Look how feedback is implemented in some other VM.

Electronically approved by doc. Ing. Jan Janoušek, Ph.D. on 22 January 2025 in Prague.