CS4215 Programming Language Implementation

Challenge A:
Just-in-time Compilation for simPL

1 Setting

Early in the project (by Monday, 12/3), the interested student indicates his/her intention to work on the project by email to the lecturer, with a rough outline of the project schedule. Discussions with tutors and lecturer are done on a per-need basis. A mid-way check will be around 20/3, with an informal meeting (tutor and/or lecturer). The project completion date is on Friday, 30/3.

2 Goal

The goal of this challenge is to design and implement a just-in-time (JIT) compiler/virtual machine system for simPL.

3 Requirements

- Use an interpreter for simPL (similar to Lab Task Week 5) as a starting point.

- Keep track of the number of times that functions get executed.

- If the number of times a function gets executed exceeds a threshold, the function is compiled into sVML (or a variant of sVML that you need to design).

- The next time the function gets executed, control is passed to the virtual machine which starts executing the compiled version of the function.

- The performance of the JIT system should be evaluated by comparison with the virtual machine (Lab Task Week 6) and the interpreter (Lab Task Week 6).

4   Submission and Assessment

After project completion, the student sends all software and other documents in a zip file to the lecturer via email. Please include instructions how to install and run the application. The submission will be assessed by the tutors and lecturer. If the project goals are achieved, the student will be asked to present the solution in person to the lecturer and tutors. Sufficient achievement leads to issuing of an Assignment Voucher, which the student can use at the end of the semester to replace any module assignment score by full score.