Functional language compiler to WebAssembly - Expert meeting

During this meeting, the project was presented, and the requirement specification was shared with the experts.

Location: C20.19 HEIA-FR

Date: 07.06.2024 10:45 - 11:30

Agenda

- Welcome
- Presentation of the requirement specification
- Questions and answers
- Next meeting

Participants

- Valentin Bourqui (expert)
- Baptiste Wicht (expert)
- Noah Godel (student)

Information shared

- Since there are already existing solutions for compiling Haskell to Wasm, and the GHC (Glasgow Haskell Compiler) supports emitting its IR (LLVM or Cmm), this project doesn't effectively add something new (so the project is more of an academic exercise).
- The GHC IR is complex and not very well documented, and it is not easy to work with, so it would be hard to use it as a base for the project (either generating it and using GHC as a backend or using it to generate Wasm code).
- The fact that the project is more of an academic exercise than a real-world solution is not a problem, but the student needs to be aware of it and document it.
- Iterative development is very important for this project; do not try to do everything at once. A very minimal version should be implemented first, and increasingly more complex example programs should be implemented. The project's scope is already quite large, so it is important to focus on the core features first to have something to show at the end.
- Optimization and garbage collection are not priorities, but it is important to have a clear idea of how they could be implemented and what the limitations are.
- Reference counting (RC) is a good choice for a first implementation of garbage collection if there is enough time. However, it is definitely not required for the first iteration of the project.

- This project is ambitious, and it is good that there is some flexibility in the choice of the language features that will be supported since it is not known how much of the language will be implemented in the end. The student needs to decide on the technologies that will be used as soon as possible to start the implementation.

Decisions

- The student should clearly document the different existing solutions and explain why the chosen approach was selected.
- The student should focus on making a very minimal version of the compiler and then try to create increasingly more complex example programs to have something to show at the end.
- The student should not spend too much time on things like optimization or garbage collection; these can be added later if there is time. The project's scope is already quite large, so as long as the limitations are clear and well-documented, it is fine.
- The student should decide on the technologies that will be used as soon as possible to start the implementation.
- The next meeting will take place in the second-to-last week of the project (no fixed date yet).

Tasks

What?	Who?	Deadline
Make the choice of the technologies	Mr. Godel	07.06.2024