Assignment 5: Choose-Your-Own-Adventure Proposal

15-411: Compiler Design
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Due Thursday, November 17, 2016 (9:00am)

Note: For this written assignment *only*, you should work together with your teammate to complete the assignment. This is intended as 1) a way for you to brainstorm interesting, fun ideas; and 2) a way to give you an option that you can choose for your L6 compiler.

A Project Proposal

For Lab 6, each team is asked to choose one of a set of options for their project; these options include

- retargeting your compiler to LLVM,
- extending the source language of your compiler to `C1` (and beyond),
- implementing garbage collection,
- defining and implementing your own project (choose your own adventure).

To prepare for Lab 6, we ask you to provide a possible option for "choose your own adventure" that you have thought through. For your Lab 6 compiler, you can still choose to implement any of the pre-defined options. You could also do something other than what you have proposed in this proposal. The purpose of this assignment is simply to get the creative juices flowing!

In more than one page but less than two (single spaced, 12pt font), tell us about a project that you think would be interesting and fun to implement by augmenting your compiler. This project should involve a reasonable amount of work but be something you think you can achieve in the alloted amount of time for the Lab 6 compiler. Ideas that have been pursued in the past include:

- Steganography (encoding/decoding strings through binaries)
- Compiling C0 to SML
- Compiling C0 to Whitespace
- Compiling C0 to Clac

- Rust-style variable lifetimes
- Control flow integrity (protections against buffer overflows and similar exploits)
- N-dimensional arrays

You should propose a project that has not been pursued in the past and is not one of the pre-defined ones. In your proposal, you should be sure to include:

- A description of what you plan to do. This should be about 1/3 of the proposal.
- A brief motivation of why it's interesting to you or to the field.
- How you plan to implement it: what changes do you need to make to the high level structure of your compiler? Are there phases that you would like to add, and how do they interact with the end goal? This should be about 1/3 of the proposal.
- How you plan to test it: how do you know if your project is successful? What sort of testing suite would you provide?

Have fun! And if you have any questions at all about this assignment (or would like to talk out if something is a "reasonable" amount of work), please feel free to post on Piazza or talk to the course staff at office hours.

Grading

You can earn 50 points for this assignment. We will roughly divide the points as follows: 10 points for the general idea, 5 points for the motivation, 15 points for the description, 15 points for the implementation plan, and 5 points for testing part. Please make sure

What to Hand In

Submit before the deadline a 1-2 page, single spaced, 12pt font PDF file with your proposal to Autolab. Make sure that the PDF contains the following header:

Lab 6: Adventure Proposal
Secret team name: YOUR TEAM
Title: YOUR TITLE

Either team member can make the submission.