Final Project Details (4 credit hour sections)

Graduate students (and those taking the course for **four credit hours**) must complete a project for their fourth credit hour. Students registered for three credit hours do not need to complete a final project.

You may work alone or in groups of two to three people. You should expect about two MP's worth of work for each person involved in the project. You may do any of the following:

- Find a research paper published in ACM or IEEE that details a programming language concept, and implement it.
- Pick two published research papers on programming language topics [https://wiki.haskell.org/Research_papers][(some may be found here)], write a two to four page summary of each, and prepare a twenty minute presentation of each.
- Develop some content or a tool to improve the quality of CS 421.
- Develop a project idea of your own, based on previous experience or research interests.

Project Proposal

Write a proposal at least half page long that details the scope of your project and an implementation schedule. If you are basing your project on a paper, cite the paper and provide a URL to a PDF version. Be sure to include a description of the target language you want to work on, the concept you want to implement, and an outline of how you would like to to demonstrate your project at the end of the semester. Also, give a clear outline of each individual's responsibility in the project.

Your proposals are due by July 22, 2020. You should submit your proposal electronically, in plain text form contained in the body of an e-mail message (no attachments please). It should be not more than two pages long. Feel free to ask for an appointment to discuss the project proposal with me before the proposals are due.

Final submission

By default, project demonstrations and paper presentations will be the week of August 1. This can be rescheduled if necessary. To avoid an incomplete in this course, you should present your final submission by the end of finals week. Presentation is loosely defined here: a two or three page email summary is often sufficient, but some students like to have a presentation over Zoom.

Project Reports

At the end of the project, you need to turn in two things:

- a project directory in your repository containing your source code, tests, and Makefile; and
- a project report, as a PDF file, containing the information below. In addition to the work turned in, each group will give a brief presentation and demo of their code.

You may create a separate git repository if you prefer that. Your final report should have 4 sections:

Overview

Describe the motivation, goals, and broad accomplishments of your project in general terms.

Implementation

A brief description of the important aspects of your implementation, in terms of (a) the major tasks or capabilities of your code; (b) components of the code; (d) status of the project – what works well, what works partially, and and what is not implemented at all. You MUST compare these with your original proposed goals in the project proposal.

Tests

Coming up with appropriate tests is one of the most important part of good software development. Your tests should include unit tests, feature tests, and larger test codes. Give a short description of the tests used, performance results if appropriate (e.g., memory consumption for garbage collection) etc. Be sure to explain how these tests exercise the concept(s) you've implemented.

Listing

A listing of your code. The code should be documented thoroughly and clearly. You don't need to comment every single line or even every single function. Instead, focus on the central functions and data structures in your implementation, and document them well.

Citation

This project outline based heavily on Elsa Gunter's CS 421 website.