

The goal of this project is for you to get in-depth experience with a programming model and/or program analysis or code generation issues relevant to a programming model. A meta-goal is that you will learn research techniques.

## 1 Guidelines

You may work by yourself or with a partner on this project. Obviously, if you work with a partner, your combined project should be more ambitious than if you were working by yourself.

You may experiment with compiler and/or run-time program analyses in this project. I have provided a list of possible projects at <http://www.cs.colostate.edu/~cs653/Project/possible-projects.html>. You may also propose a project that is not on this list. Either way I highly recommend that you discuss the project with me in office hours before writing your first proposal. Insufficient proposals will need to be rewritten.

## 2 Deliverables

For each deliverable, you need to submit an electronic copy by email to [mstrout@cs.colostate.edu](mailto:mstrout@cs.colostate.edu) and a hardcopy version at the beginning of class.

### 2.1 Preliminary Project Proposal and Proposed Tool Example (5% of course grade)

**Due:** Feb 11

The preliminary project proposal should be one paragraph describing your project.

The Proposed Tool Example should be approximately two pages describing which tool you plan to use within your project and a DETAILED plan for an example project using the tool. The example project should be similar in scope to the “Writing a Walker” piece of project 2 from CS553 2005. See <http://www.cs.colostate.edu/~mstrout/CS553/projects/project2.pdf> for more details. If you were planning on using a compiler infrastructure, your tool example could be a program that uses the compiler infrastructure to count all of the if statements in the program or some other piece of program trivia.

### 2.2 Proposal (5% of course grade)

**Due:** February 25

The proposal should include a description of the problem you will solve, the tools you will use, how you will test your analyses, and what experiments you will run with your analyses (or how you will evaluate your project). If you will be building on an existing code then you should also describe how you intend to extend it. At the time you write your proposal you should be familiar with the tools and any code that you will be

extending. The proposal should be no longer than 3 pages of text unless you are doing your project with a partner, in which case it can be up to 4 pages.

Unsatisfactory proposals will be returned to the students for revision.

As a separate part of the proposal, you will be submitting the results of your tool example implementation. You will need to submit a tar ball of the relevant code by email. Make sure to include a README file in the tarball with instructions on how to build and run the tool example. Also, you will need to submit a 1-2 page description of the tool example and any issues you had while doing the example.

## **2.3 Verbal Status Report (5% of course grade)**

**Due:** March 24

Midway through the project, you will be presenting your problem, approach, and current status. Your verbal status report will be limited to three slides and 15 minutes. Included in the 15 minutes is time for the class to provide feedback and discuss any issues you may be having. The slide limit and time limit is strict. You will be graded on your presentation skills, therefore you should practice this talk ahead of time.

## **2.4 Intermediate (5% of course grade)**

**Due:** April 2

At the time you write this document you should already have implemented a working prototype of your analyses (you may make additions to the prototype or tune it afterwards but the basic core should all be there). This document should describe what you have built in detail and what challenges you faced in building and debugging it. You should also describe how you have tested the prototype. This document should be no more than 4 pages of text if you are working by yourself and no more than 6 pages if you are working with a partner.

## **2.5 Final and Elevator Speech (10% of course grade)**

**Due:** May 7

This document describes any extensions you made to your prototype since the intermediate stage, the experiments you ran on your program analysis, the results of the experiments, and an analysis of the results. When you submit this document, you should attach the “proposal” and “intermediate” documents to it.

On May 7th, you will also be giving a three minute “elevator speech” on your project.

# **3 Acknowledgements**

*Writeup adapted from Amer Diwan's writeup for a similar project:* <http://www-plan.cs.colorado.edu/diwan/7135/project.html>