CISC 471 Compiler Case Study

Spring 2008

Learning Objectives: Students completing this homework should be:

   1. Aware of the various open-source compilers available today and how they differ

   2. Gain an understanding of different approaches to the architecture of a compiler

   3. Know how to select an appropriate compiler infrastructure for a particular implementation task and experimental evaluation.

   4. Gain experience in creating and presenting a short talk (5-7 minutes) on a technical topic

The Project: The project can be broken into the following sequence of steps:

   1. Form a group of 2 students and select a compiler from the list below and submit your group names and top 3 choices in order to the instructor by Saturday noon, May 3.

   2. On the web page for the compiler, read some of the documentation, presentations, etc concerning the compiler to answer the following questions:

        1. Who and where is the compiler being developed?

        2. What are the possible source languages compiled, and the possible targeted computer architectures?

        3. What is the overall architecture of the compiler? What are the different phases that the programs go through? What are the major components? Download or create a figure that shows the different phases and inputs and outputs of each phase.

        4. What are the program representations used throughout the various phases of compilation?

        5. What has this infrastructure already been used for in research? What uses/attributes do the developers promote as the compiler's main purpose/strength?

            6. What source programs (benchmarks) do the compiler developers claim will run successfully through their system?

        8. What limitations/restrictions do the developers note at this time for the compiler?

        9. What future enhancements are planned?

   3. Create and bring to class or email a well organized, well designed powerpoint presentation (no more than 5-7 slides) that includes the answers to these questions, in a nicely organized, interesting way, using relevant pictures or figures where possible.

   4. Prepare to present your powerpoint presentation during class on Thursday, May 8, with both partners doing some part of the presentation.

Restrictions/Suggestions:

+ You should work in pairs on this project.

+ Assignment of compiler choice will be made on a first come first serve basis.

+ Each group must choose a different compiler.

Grading Criteria:

+ content: The content of your presentation is the most important aspect. The content should adequately cover the topics above, and be correct, without too much extraneous information.

+ organization: The presentation should flow clearly from one slide to the next in an organized manner.

+ looks of the slides: The presentation should be easy to understand, appealing to the audience, but not too distracting.

+oral presentation: The oral presentation should be clearly spoken, without distractions, informative and interesting.

Possible Compilers for Investigation:

   * Open64, Intel

   * SableCC, McGill University

   * Trimaran, HP

   * Zephyr, University of Virginia

   * SUIF, Stanford University

   * LLVM, Georgia Tech

   * Phoenix, Microsoft

   * abc, AspectJ compiler, McGill University

   * Flex Compiler, MIT

   * Scale, University of Texas

   * Others, upon approval by instructor