CSC 348 Introduction to Compiler Design
2014-2015 Fall Quarter
Mon & Weds   3:10PM – 4:40PM
CDM 224
http://d2l.depaul.edu/

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Office Hours: Mon. and Tues. 10:30-12:00

Summary Of Course

In this course we will introduce some basic concepts in compiler construction. There will be extensive programming as we try to write our own compiler for a simple C-like language in Java. We will attempt to cover the following topics:

- Lexical analysis, finite automata
- Syntactic analysis, context-free grammars
- Abstract Syntax Trees, semantic analysis, tree transformations, visitor pattern
- Code generation and x86 assembly
- As time permits, data-flow and control flow analysis

Learning Objectives

Upon successful completion of this course, students should be able to:

- Design a regular expression to match a particular set of strings
- Design a context free grammar for a simple language
- Modify a context free grammar of a language to add a new language construct
- Modify the various phases of a compiler to implement a new construct in a language

Prerequisites

Data Structures (CSC383 or CSC393) and Computer Systems I (CSC373)

Grading Policy

Your overall grade for the course will be computed as follows:

Homework	30%
Quizzes	10%
Exam (week 6)	30%
Final Project	30%

Letter grades will be assigned as follows:

93-100	A
90-92	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-
67-69	D+
60-66	D
0-59	F

Textbooks and Printed Resources

Crafting a Compiler. Fischer, Cytron, and LeBlanc, 2010. ISBN: 978-0-13-606705-4

Homework

All homework and all final project deliverables must be submitted on D2L before the deadline. Late submissions will not be accepted, so make sure to submit whatever you have before the deadline.

Students may work in groups of at most 3 students on homework assignments. A single student from each team/group must submit the group assignment for everyone. The person submitting should write the names of all the students in the group in the comment box when submitting and everyone's names should appear within the submission itself (the document or code). Group members who are not submitting should submit a comment indicating who else is in the group and who is responsible for submitting the group's work.

Homework will involve making additions/modifications to a substantial codebase and I don't have time to track down errors, missing files, changes, etc. For this reason, students must do the following:

- Your submission **must** include a text README file that describes the changes you made. This is especially important if you failed to complete the assignment. You need to explain to me what changes you made, what successes you think you had and a description of what is going wrong.
- Your submission must be created using "ant submit" as described in class. This will create a zip file for you to submit.
- You must test your submission! Download your submission into an empty folder. Run ant on it and see if the resulting executable works. Also check to make sure it includes your README file!

Failure to abide by these guidelines will result in a significant reduction in points (at least 10 points).

Quizzes/In class work

We will periodically do quizzes or in class work that will be submitted and graded. These will provide low-stakes assessment and learning opportunities for you. They cannot be made up, but the lowest in- class assessment grade will be dropped so you can miss one without any penalty.

Exam

The exam is closed book and closed notes except for a single 8.5" by 11" sheet of notes (both sides). The sheet of notes must be turned in with your exam and will not be returned so please make a copy for yourself before taking the exam. The exam will take place in class on Wednesday, October 15, during the regular class time. Place this on your calendar now. Make-up exams will only be given for true emergencies and require documentation.

Required Tools

We will be working on a real compiler for a subset of the C language. The compiler is written in Java, but will compile into GAS x86 assembly. This means it is NOT enough to just have Java on

your machine. In order to test your code you must have a GAS x86 assembler as well as a machine that runs x86 code.

You will need the following software

- Java JDK
- Apache Ant
- MinGW
- SableCC (a jar file)
- Eclipse

 The first assignment will step you through the installation process.

In addition, the projects will start getting large enough that a graphical development environment will be extremely useful. We will be using Eclipse in class and the assignments will be packaged as Eclipse workspaces/ projects. You should install Eclipse too, although strictly speaking it is not required.

Email

Email is the primary way I communicate with students outside of class. To make email communication as smooth as possible, please make sure to do the following:

- Students should be sure their email listed under "demographic information" at http://campusconnect.depaul.edu is correct. All my emails to you will go to that address. When I reply to homework questions, I reply to the whole class and so the reply gets sent to your campus connect email address and not necessarily to the one from which you sent me the question.
- Send questions from an email address that identifies who you are. You have the best chance of getting through the email spam filter if you use your DePaul email address. You have the greatest chance of the email being filtered or of me ignoring it if you send it from an address that I cannot recognize immediately as a student in my class. (I once had a student send me email from way2sexy@hotmail.com.)
- Include the course number in the subject of all emails. If I receive an email from you without the course number (CSC348) in the subject, I will not notice that it is from a student and there will be a delay in receiving a reply. If I do not recognize what course you are in, I will not waste time looking up which course you are in, I will simply reply asking you which course you are in. This will of course add to the delay in getting your

question answered, so just avoid all this and include the course number in the subject line.

- If your question was answered in the lecture or in another email, I will simply refer to the lecture or email. So if you did not understand something I said in class or in an email, be specific. Point out exactly what you didn't understand in my prior communication so that you don't get the generic reply of watch the video/read the email.

Changes to Syllabus

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be thoroughly addressed during class, posted under Announcements in D2L and sent via email.

Online Course Evaluations

Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over three weeks. Students do not receive reminders once they complete the evaluation. Students complete the evaluation online in CampusConnect.

Academic Integrity and Plagiarism

This course will be subject to the university's academic integrity policy. More information can be found at http://academicintegrity.depaul.edu/. If you have any questions be sure to consult with your professor.

Academic Policies

All students are required to manage their class schedules each term in accordance with the deadlines for enrolling and withdrawing as indicated in the University Academic Calendar. Information on enrollment, withdrawal, grading and incompletes can be found at: cdm.depaul.edu/enrollment.

Students with Disabilities

Students who feel they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss their specific needs. All discussions will remain confidential.
To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably within the first week of class), and make sure that you have contacted the Center for Students with Disabilities (CSD) at: csd@depaul.edu.

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