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, regular expressions
- 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	50%
Quizzes	10%
Attendance	10%
Final Exam	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

Participation Verification

There is an "assignment" on D2L called Participation Verification. This is not a real assignment and will not be graded. It serves only to identify which students intend to take the course. Failure to complete the assignment on time will result in your name being given to administration who will in turn remove you from the course. Just take care of this now. It only takes a minute to submit a small Word document or ASCII text file stating your intention to take the course. (**Note:** D2L will not allow you to submit just a comment. You must submit a file.)

Attendance

Attendance is worth 10% of your overall grade. There are 20 class meetings, so each one is worth 0.5% of your overall grade. Each absence will lower your overall grade by 0.5%. Each class meeting you arrive late or leave early will lower your overall grade by 0.25%.

Homework

All assignments must be submitted on D2L by the due date to get full credit. Note that the deadline is always 11:59PM, the evening before a class meeting (Sunday night or Tuesday night). Submissions can be turned in up to one week late, but the maximum score they can receive is reduced 5% per day (or fraction thereof). No homework will be accepted more than 7 days after the deadline. I will grade only the LAST submission you make, so do not submit anything late that will lower your grade.

Students may work in groups of at most 3 students on homework assignments. <u>All students in the group must submit something.</u> A single student from each team/group submits the actual solution. The person submitting the real solution 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 the solution **must** instead submit a file indicating who else is in the group and who is responsible for submitting the group's work. Failure to submit this list of names will result in a 10 point penalty on your grade.

Homework will be graded based on performance on supplied tests. If your code does not compile or fails to pass any tests, you will receive a grade of 0. Because you are allowed to submit up to one week late (with a penalty) you will have a chance to ask questions in class after the due date has passed in order to try to get your code working. You will be penalized for being late, but you must submit code that passes tests in order to receive any credit.

You must test your submission after submitting it.   Download your submission into an empty folder. Unzip it and run the tests on it to make sure your submission is behaving as you expect.

Quizzes

We will periodically have quizzes in class. They will provide low-stakes assessment and learning opportunities for you. They cannot be made up, but the lowest quiz grade will be dropped so you can miss one without any penalty.

Exam

The final 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. This exam will take place 2:30PM to 4:30PM on Monday, March 14, in the usual classroom. Note that this is not the usual time class begins. Place this date on your calendar now. Make-up exams will only be given for true emergencies and require documentation. If you have a conflict at that time, drop the class now and take in the spring.

Required Tools

We will be working on a real compiler for a C-like 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. For this reason, I have created a VirtualBox virtual machine for you to use in the class. This will require that you install VirutalBox on your computer in order to do the assignments. The virtual machine will come with Eclipse already installed. We will be using Eclipse as our development environment. If you are not familiar with Eclipse, you will need to take some time getting acquainted with how to use it.

Email and Forums

Everyone must subscribe to the D2L forums for the course. When communicating with the class, I will post there. By subscribing, those posts will be sent to you via email.

Questions that are not of a personal nature and which do not include code should be posted on the D2L forum. This allows other students the opportunity to answer your question as well, which means you might get an answer faster.

For personal questions or questions that involve actual homework code, please email me directly. 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.

- 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 and complain 2 weeks later that I wasn't answering his email.)

- 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, my first response will be my asking you which course you are in. This will of course add to the delay in getting your actual 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 the discussion forum, I will simply refer to the lecture or forum post. 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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