CSE 504: Compiler Design

Admin/Logistics

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What is CSE 504 about?

- Graduate Compiler Design
  - How high level language transformed to execute on different machine architectures
    - A good compiler contains a microcosm of computer science
      - Algorithms: greedy algo, graph algo, dynamic programming
      - Theory: Finite automata, pushdown automata
      - Architecture: pipeline scheduling, synchronization
      - Complex system design
      - Optimizations
Course Outcome

• Working knowledge of the major phases of compilation

• Understand and implement how a high level language is compiled for execution on a specific machine architecture
Prerequisites

• Course:
  – CSE 303: Automata Theory
    • Refer to “Automata” course by Jeff Ullman on Coursera

• Programming Experience
  – Use of Java
  – Willingness to learn new tool chains
Lab Assignments

• Lab is divided into 5 parts – Implements compiler for the COOL language
  – Acknowledgement to Prof. Alex Aiken (Stanford) for sharing the assignment

• Lab-1: Simple COOL programs
  – Familiarize with the syntax and semantics of the language

• Lab-2: lexical analyzer for COOL

• Lab-3: parser for COOL

• Lab-4: static semantic semantic analyzer for COOL

• Lab-5: Code generator for COOL
Important Instructions for Lab

• Setup a Linux Virtual Machine (VM)

• Need to install few software
  – Please check the course webpage

• Please look at COOL reference manual
Exams, Grading

• Midterm: 20
• Final: 30
• Lab-1: 5
• Lab-2: 10
• Lab-3: 10
• Lab-4: 10
• Lab-5: 15

• Late submission:
  – Late submission: you have total 5 days late days which you can use for any assignment
  – Late penalty of 10% for each day late … after 3 days, it will not be counted

• Course Schedule
  – Reading list: more pointers to what is presented in class
  – Lecture slides: what is relevant for this course
Other resource

• Please send emails with a subject prefix
  – [CSE 504] <subject>
  – Copy everyone in class if it is a common question
  – Treat this as our discussion group