Norwegian University of Science and Technology

Compiler Construction

Welcome and Q&A Session 1 – 18.01.2021

Michael Engel

The lecture mode for now

- Flipped classroom (or “inverted classroom”) – what’s that?
  - Idea: Enable students to “attend" lectures whenever they have time
  - Usually, the lecture times are instead replaced by group work sessions
    - That’s a bit difficult to do online…
  - Weekly Q&A sessions (Mon 17:15-18:00) on zoom
    - Discussion of general Q&A on contents, logistics etc.
  - Weekly discussion sessions (Fri 14:15-16:00) on zoom
    - Discussion of solutions to exercises handed in
    - Hints for and overview of new exercises for the week
- The situation might change if (when!) the Corona situation improves

Course information

- Main source of information on the web: http://folk.ntnu.no/michaeng/tdt4205_21/
  - Syllabus, lecture slides, exercise sheets, video links, …
- Youtube lecture videos
  - Linked from web page
- Blackboard course
  - Submission of exercises
  - Announcements
- Piazza discussion forum
  - https://piazza.com/class/kjsdwd5wmr05j6

Exercises / Assessments

- Theoretical exercises: ***recommended***
  - Six theoretical exercise sheets
  - Corrected and commented on, but not part of the grade
- Practical exercises: ***mandatory***
  - Six practical exercises
  - Subsequent exercises are based on earlier ones
  - Practical exercises make up 50% of the overall grade
  - Each practical exercise is worth 1/6th (16.6%) of this
- Submit solutions ***in groups*** (2 or preferably 3 students)
  - Find group partners on piazza, enter in Blackboard (yes, that's not ideal… but I didn't want to force groups)
- Submission dates of theoretical and practical exercises *overlap!* Theoretical exercises serve as preparation for the practical part

Overview of practical exercises

- Practical exercises
  - Handouts starting this week
  - Two weeks time to submission
  - We are going to write a compiler for a simple procedural language

Week	Publication date	Handin date	Topic
3	22.01.2021	05.02.2021	Practical C exercises
5	05.02.2021	19.02.2021	Hands-on with scanner generators
7	19.02.2021	05.03.2021	Parsing and VSL specification
9	05.03.2021	19.03.2021	Syntax tree simplification
11	19.03.2021	09.04.2021	Symbol table construction
14	09.04.2021	23.04.2021	Code generation

Grading

- Letter-based grading is back! (Hooray?)
- Two parts:
  - Practical exercises (50%)
  - Home exam (This probably won't change) (50%)

- The exam will be based on the lecture contents, theoretical and practical exercises
  - We will publish an example exam with typical questions
  - In addition, we will publish a sample solution for self assessment
  - Of course, we will also have a Q&A session for this

Teaching assistants

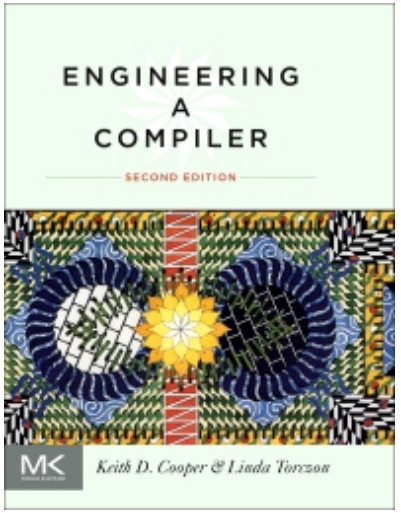
- John Rogers (PhD candidate @ IDI CAL)
- Aksel Hauge Slettemark
- Andreas Aaberge Eide

Semester overview

- Structure of a typical compiler
- Frontend
  - Scanning
  - Parsing and grammars
- Intermediate representations
  - Abstract syntax trees (ASTs) and SSA form
- Backend
  - Code generation
  - Code optimization
  - Linking
- Static code analysis

Literature

Authors	Keith Cooper, Linda Torczon
Title	Engineering a Compiler (Second Edition)
ISBN	9780120884780 (hardcover) 9780080916613 (ebook)



+ additional papers, articles, … on my web page: http://folk.ntnu.no/michaeng/