

TDDD55 Compilers & Interpreters

TDDDB44 Compiler Construction

2017

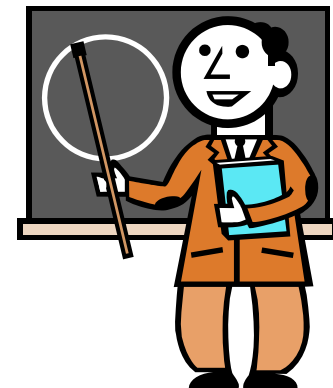
Organizational Issues

Martin Sjölund, IDA

Staff 2017

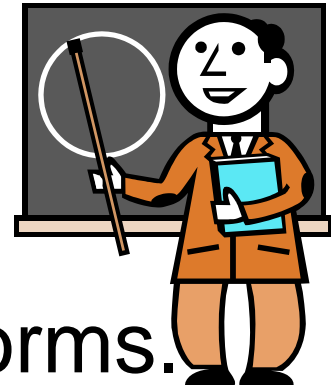
- Martin Sjölund (MS), Examiner, Course leader, Lecturer, Tutorial assistant TDDB44
- Jonas Wallgren (JW), Lecturer
- Peter Fritzson (PF), Guest Lecturer
- Mahder Gebremedhin, Lab assistant TDDB44
- Zeinab Ganjei, Lab/tutorial assistant TDDD55
- Helene Meisinger, Course secretary TDDB44
- Mikaela Holmbäck, Course secretary TDDD55
- Ahmed Rezine, Director of studies

Lecture Plan



- F1: Introduction (MS)
- F2+3: [opt. f. TDDDB44] Short introduction to formal languages and automata (JW)
- F4: Lexical analysis; Symbol tables (JW)
- F5: Parsing; Top-Down Parsing (JW)
- F6: Top-Down Parsing cont., Bottom-Up Parsing (intro) (JW)
- F7: Bottom-Up Parsing [LR(0) items opt. f. TDDDD55] (JW)

Lecture Plan (cont.)



- F8: Semantic analysis and internal forms. Syntax-driven translation. (PF)
- F9: Memory Management; Run-time organization (PF)
- F10: Code optimization (PF)
- F11: Code generation, general (MS)
- F12: [\[opt. f. TDDD55\]](#) Code generation for RISC and superscalar processors (MS)
- F13: Error management. Interpreters (MS)
- F14: Bootstrapping. Compiler Generators (MS)

Lessons/Tutorials

5 for TDDDD55, by Zeinab Ganjei

4 for TDDB44, by Martin Sjölund

- Exercises on background theory (TDDDD55)
- Preparation for the laboratory assignments
- Exam preparation session

Laboratory Assignments

- Separate for TDDD55 (2hp) and TDDDB44 (3hp)
 - TDDD55: 1 lab group
 - Zeinab Ganjei (1)
 - TDDDB44: 2 lab groups
 - Mahder Gebremedhin (2)
- Teams of size 2
- Register via webreg linked from the course homepages)
 - Deadline for registration:
Sunday November 12, 2017



Rules for examination of computer labs at IDA

- You are expected to do lab assignments in group or individually, as instructed for a course. However, examination is always based on individual performance.
- **It is not allowed** to hand in solutions copied from other students, or from elsewhere, even if you make changes to the solutions. If there is suspicion of such, or any other form of cheating, teachers are obliged to report it to the University Disciplinary Board.
- **Be prepared to answer** questions about details in specific code and its connection to theory. You may also be asked to explain why you have chosen a specific solution. This applies to all group members.
- **If you foresee problems** meeting a deadline, contact your teacher. You can then get some help and maybe the deadline can be set to a later date. It is always better to discuss problems, instead of, e.g., to cheat.
- **Any kind of academic dishonesty**, such as cheating, e.g. plagiarism or use of unauthorized assistance, and failure to comply with university examination rules, may result in the filing of a complaint to the University Disciplinary Board. The potential penalties include suspension, warning.
- Policy for handing in computer lab assignments at IDA
- **For all IDA courses** having computer lab assignments there will be one deadline during or at the end of the course. If you fail to make the deadline, you must retake the, possibly new, lab course the next time the course is given.
- **If a course deviates** from this policy, information will be given on the course web pages.

Policy for handing in computer lab assignments

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- Lab deadline: December 20 2017
- Recommended last day to hand in final labs is the last scheduled lab: 2017-12-19 (TDDDB44) / 2017-12-14 (TDDDD55). (Your teacher might be unavailable for example due to travelling)
- After correction of the exams, your lab assistant will be busy with other courses and work. If you have only 1 (TDDDD55) or 2 (TDDDB44) labs remaining, it might be possible to correct the labs; but if the lab assistant does not have time, you may need to wait until the next time the course is given.

Exams

- Most assignments are the same for TDDB44 (3hp) and TDDD55 (2hp)
 - TDDD55: Formal languages / automata theory
 - TDDD55: Using an LR Parser
 - TDDB44: Creating an LR Parser
 - TDDB44: RISC/CISC
 - TDDB44: **Extra 3 points** on the regular exam if your labs are completed and approved before the deadline (and this is the first time you are registered on the course)
- For TDDD55 students, the exam can be challenging without adequate preparation. There is an extra tutorial session to prepare you for some of the harder exam assignments.
- The TDDB44 lab series also prepares you for the exam since the labs are much more extensive. Our experience is that TDDB44 students have an easier time preparing for the exam despite the assignments being more difficult.



Literature

Mandatory (more or less):

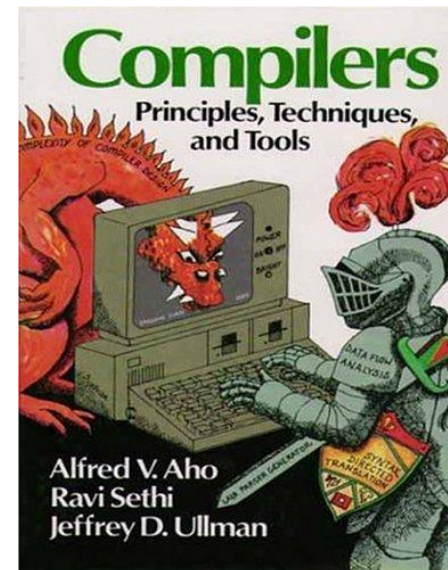
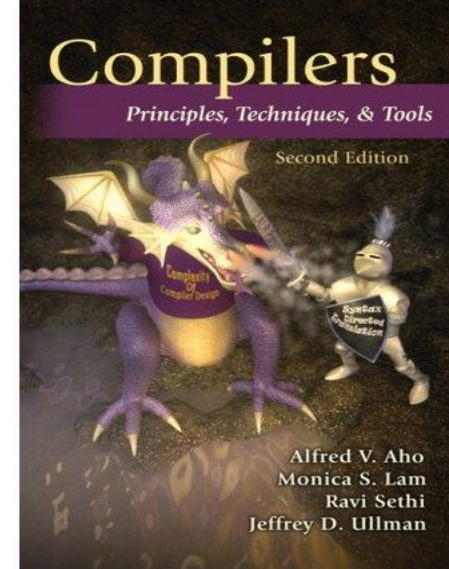
- Aho, Lam, Sethi, Ullman: *Compilers Principles, Techniques, and Tools, Second Edition*. Addison-Wesley, 2006. (Also as paperback, 2007; new edition 2013?)
- Or the old, first edition (still ok)
Aho, Sethi, Ullman: ..., 1986.

Mandatory for TDDDB44:

- *Compiler Construction Lab Assignments*, Kompendium, 2016 (or 2014+), Bokakademin

Optional:

- P. Fritzson: *TDDDB44 Compiler Construction Lecture Notes*, 2016, and other lecture notes, are on the course home page.
- *Compiler Construction Exercises*, Kompendium



For more information ...

See the course homepages,

– www.ida.liu.se/~TDDD55

– www.ida.liu.se/~TDDDB44

- Schedule
- Reading directions
- References to additional literature
- Laboratory instructions for TDDD55
 - (but the lab skeletons are in `/home/TDDD55`)

What comes after this course?

- Join our compiler research team at PELAB and do a ***master thesis project*** in compiler technology!
 - Compiling for OO modeling languages (P. Fritzson, M. Sjölund)
 - Operational semantics based compiler generation (P. Fritzson)
 - Compiler bootstrapping, international open source compiler, www.openmodelica.org (P. Fritzson, M. Sjölund)
 - OO modeling language compilation on parallel machines (P. Fritzson)
 - Compilation & parallel programming on industry clusters (P. Fritzson)
 - Compiling for parallel / embedded systems (P. Fritzson, C. Kessler, M. Sjölund)
 - Code generation for embedded systems (C. Kessler)
 - Debugger technology (P. Fritzson, M. Sjölund)
 - ... and more!