SSE2-PLDE:
Programming Languages, Description and Execution

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Overview (preliminary)

Practicalities:
- Lectures and project meetings: Seminar Room at Maersk Institute
  - Tuesday 8.15-11.45, Weeks 5-11
  - Thursday 8.15-11.45, Weeks 5-11 (Thursday 11.2 is moved to Friday 12.2,12.15-15.45)
- Project groups: 3-4 students
- Information, slides etc. : BB (under "Course Documents" only)
- http://www.dcs.gla.ac.uk/~daw/books/PLPJ/
- **Project due Thursday 18.3 at 12.00 noon at the secretaries' office at Maersk Institute**
- **Exam: Wednesday 24.3 (week 12)**

Schedule:
- 2.2 Lecture: Introduction + Lexical Analysis
- 4.2 Lecture: Language Design, Programming Paradigms
- 9.2 Lecture: Syntax Analysis
- 12.2 Project: Meeting
- 16.2 Lecture: Translation
- 18.2 Project: Meeting
- 23.2 Lecture: Runtime System
- 25.2 Project: Meeting
- 2.3 Lecture: Object-Oriented Modeling, BETA language
- 4.3 Project: Meeting
- 9.3 Lecture: Conceptual Modeling and Programming
- **11.3 Project: Meeting**
- **16.3 Project: No Meeting**
- **18.3 Project: No Meeting**

Syllabus (preliminary)

- Watt & Brown: Programming Language Processors in Java
  - Ch. 1: 1.3
  - Ch. 2: 2.1 (not examples 2.2-2.10), 2.2 (not examples 2.12, 2.13)
  - Ch. 3: 3.1
  - Ch. 4: 4.1.1, 4.2.1-4.2.4, 4.3.4 (not examples 4.15, 4.16), 4.4, 4.5
  - Ch. 5: 5.3
  - Ch. 6: 6.4.2, 6.7-6.8
  - Ch. 7: 7.2
  - Ch. 8: 8.2, 8.3
  - App. C: C.1-C.3

where the topics in
• 4.2.4
• Pages 101-102
• 4.4.2 (page 114)
are only discussed informally

- MacLennan: Principles of Programming Languages
  - p. 45-51, 86-89, 101-110, 121-126, 137-138, 180-190, 263-272
- B.B.Kristensen, O.L.Madsen, B.Møller-Pedersen:
  The when, why and why not of the BETA programming language
  - Sec. 3.0-3.1, 4.0-4.4, 5.0-5.1
- Kristensen: Associative Programming and Modeling: Abstractions over Collaboration
- Kristensen: SSE2-PLDE slides, Spring 2010 Slides only according to the above description

Exam (preliminary)

Topics:
- Analysis
- Translation
- Interpretation
- Language Design & Abstraction

Practicalities:
• Seminar Room at Maersk Institute (time schedule to be announced)
• Oral: Topics + project
• Internal examiner, 7-point marking scale
• Individual oral exam (approximately 30 minutes each)
• Individual slides (10-15) can be included in a presentation
• Bring USB stick (use of own PC is the responsibility of the student)

Form:
• Student
  • draws a topic number
  • presents the topic and includes project work when relevant
  • 10-15 minutes, typically only interrupted with minor elaborations and corrections
• We discuss issues in relation to the topic

Exam Topics

Topics/Questions:

Analysis
- (Scanning)
- CFG, Recursive Descent, AST, (Visitor+checker)

Translation
- AST+Visitor, encoder
- (Nonlocal variables), Backpatch, OO-representation

Interpretation
- Recursive+iterative interpreters, “tombstones”
- TAM

Language Design & Abstraction
- Language principles
- Examples from Fortran, Algol, Pascal, Ada
- Abstraction
- Concepts+Phenomena, (BETA)
- Association, Bounded Buffer

Either
- Select relevant parts from literature and slides
- Prepare a presentation based on these
- Eventually relate topic to relevant parts of your project where possible

Or
- Select relevant parts in your project
- Prepare a presentation based on such concrete examples from your project
- Select relevant part from literature and slides and extend your presentation with these

Or
- Some mixture …

Project:
- Analysis
  - BoCoLa: Scanner, CFG, Recursive Descent, AST
- Translation
  - BoCoLa : AST+Visitor, translation to Java code
- Interpretation
  - BoCoLa runtime system (Activity, Participant)
- Language Design & Abstractions
  - BoCoLa collaboration,
  - Design, alternatives
  - Synchronization extension