City University London

IN2009

Language Processors

Epilogue (Week 11)

Revision

Christian Cooper

What's in store this week

- Revision of weeks 1-5, 7-10
- The Exam
- Any other questions

Guide to textbook

- Chapter 1
- Chapter 2 (2.1, 2.2, 2.5)
- Chapter 3 (3.1, 3.2 [but not after page 47 FIRST and FOLLOW until page 51 Eliminating Left Recursion, 3.4)
- Chapter 4 (4.1, 4.2, 4.3)
- Chapter 5 (5.1 [but not functional symbol tables], 5.2)
- Chapter 6 (not higher-order functions, 6.1, sketch of 6.2),\\
- Chapter 7 (7.1, 7.2, 7.3 [as covered by Session 7 foils])

Session 1 recap

Session 1

- Module details, aims, resources
- What is language processing and implementation?
- Syntax definition
- Straight-line programming language
- Abstract syntax trees
- Some Java reminders...

Session 2 recap

Session 2

- Language processing
- Lexical analysis
- Syntax analysis
- Lexical syntax (token) examples
- Lexical syntax (token) definition
- Regular expressions
- Implementation
- Tools

Session 3 recap

Session 3: Parsing (syntax analysis)

- syntax definition
  - context free grammars (BNF)
- parsing
- ambiguous grammars
- removal of left recursion
- top down recursive descent parsing
- extended BNF (EBNF)
- parsing using JavaCC

Session 4 recap

Session 4: Parsing (abstract syntax)

Covered in weeks 4 and 5.

- MiniJava introduction and parsing
- Lookahead
- JavaCC grammars and semantic actions and values
- Simple expression evaluator
- Abstract syntax trees

Session 5 recap

Session 5: Semantic analysis

- Symbol tables
  - Environments
  - Hash tables
  - Symbol table for MiniJava
- Typechecking

Session 6 recap

Session 6: Activation Records (Stack Frames)

- Memory model
- Local variables
- Stack frames
  - layout
  - frame pointer and stack pointer
  - parameter passing
  - calling conventions
- Static links
- Frames implementation

Session 7 recap

Session 7: Translation to intermediate representation

- Intermediate representation
- Assembly language - a recap
- Why use IR
- Definition of an IR using trees
- Example translations
- See book for while-loops, for-loops, functions, declarations

The Exam

- 1.5 hours in length
- Answer TWO questions from a choice of three.
- Must achieve a minimum of 30% on the exam to pass the module.
  - Regardless of coursework marks.

Q. What happens if I don't get 30%?

A. You will have to resit the exam in the summer.

What will be on the exam?

Q. What topics mght be on the exam?

A. Everything.

Q. What questions <u>will</u> be on the exam?

A. You'll find out in May/June!

Next Lecture

- Final labs were ***today***…
- No lectures ever again...
  - (For this module!)
- Keep an eye on Cityspace in the next few weeks
  - Sample answers for the practical assessment 1 already published.
  - Moderated marks for assessment 1 (both parts).
  - After the end of the module, sample answers for assessment 2 (and marks).

Finally...

- I wish you the very best of luck with the exam.
  - If you have worked hard, and understood the topics we have covered, you'll do fine!
- And have a good vacation!
- It is highly likely that you won't be seeing me again for any other modules on your course…
  - This is my only teaching here right now!