Formal Languages and Compilers

Dominika Regéciová

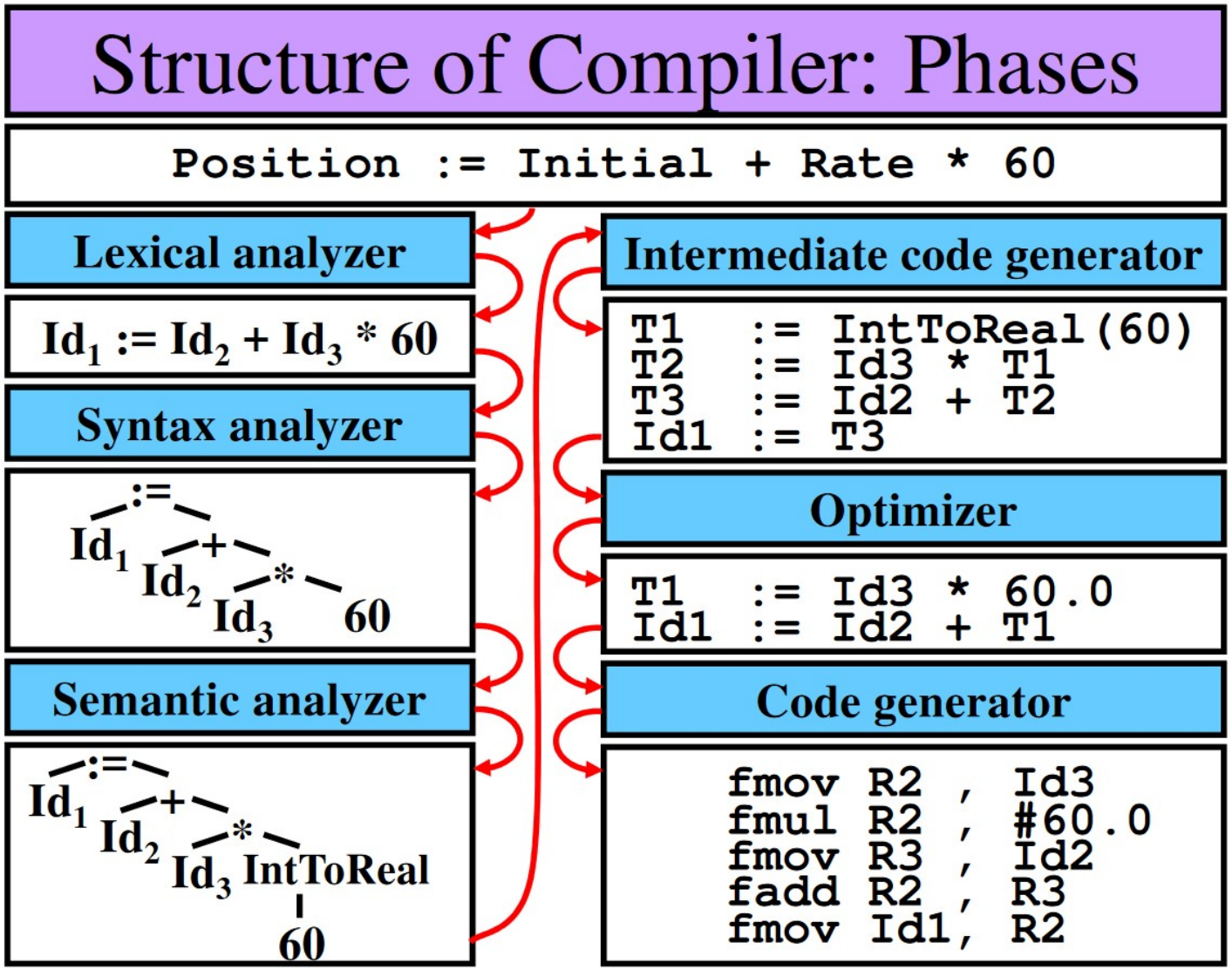
Faculty of Information Technology, Brno University of Technology
Božetěchova 1/2. 612 66 Brno
iregeciova@fit.vutbr.cz

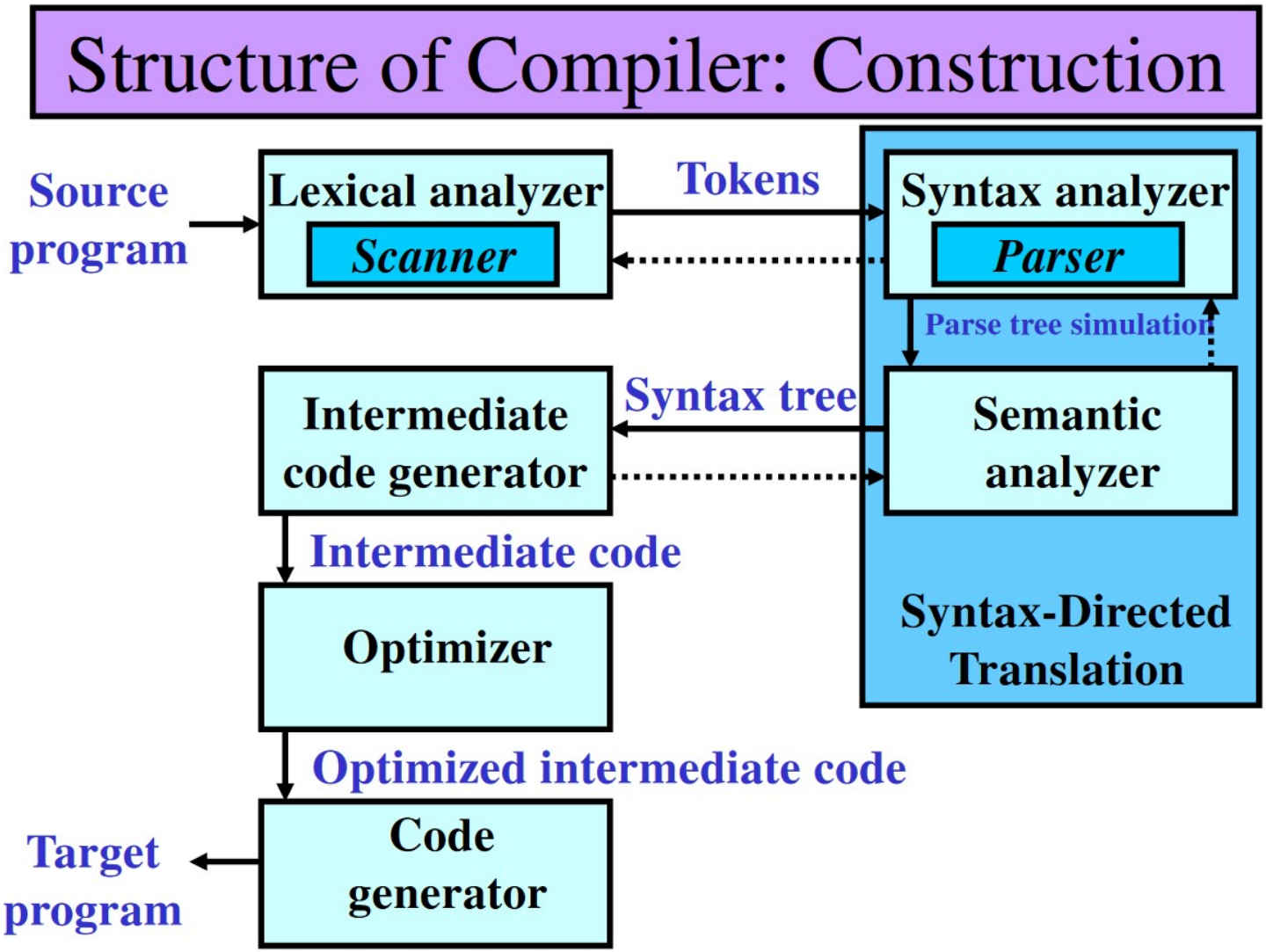
2.11.2021

- A mini review of material from the previous lectures
- Lexical analysis
- Exercises
- Extra exercise for home - 0.5 point when completed and send to me today

Review of the previous lectures

- **Name phases of compilation process**
- **What are inputs and outputs of compilers?**
- **Which phases are mandatory and which optional?**
- **What are inputs and outputs of each phase?**


Structure of Compiler: Phases
Position := Initial + Rate * 60
Lexical analyzer
Id1 := Id2 + Id3 * 60
Syntax analyzer
:=
Id1
+
Id2
*
Id3
60
Semantic analyzer
:=
Id1
+
Id2
*
Id3
IntToReal
60
Intermediate code generator
T1 := IntToReal(60)
T2 := Id3 * T1
T3 := Id2 + T2
Id1 := T3
Optimizer
T1 := Id3 * 60.0
Id1 := Id2 + T1
Code generator
fmov R2 , Id3
fmul R2 , #60.0
fmov R3 , Id2
fadd R2 , R3
fmov Id1, R2


Structure of Compiler: Construction
Source program
Lexical analyzer
Scanner
Tokens
Syntax analyzer
Parser
Parse tree simulation
Intermediate code generator
Syntax tree
Semantic analyzer
Intermediate code
Optimizer
Syntax-Directed Translation
Optimized intermediate code
Target program
Code generator

Lexical analysis slides

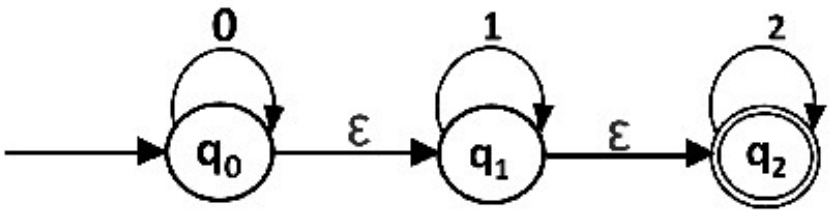
Exercise*

Construct a finite automaton that accepts the language $L = \{a^n b^n : n \geq 1\}$.

Extra exercise

- Solve till today's midnight
- Send your solution to iregeciova@fit.vutbr.cz
- You can get 0.5 points for correct and nice solution (short answer does not count!)
- Extra points does not count into credit and course minimum

Convert the given NFA into its equivalent DFA.



Thank you for your attention