



UNIVERSITY OF AMSTERDAM

ASSIGNMENT 3

Syntactic Analysis

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Lecturer:

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Course:

Compiler Construction

Course code:

5062COMP6Y

1 Introduction

2 Assignment

2.1 Precedence and Associativity

$$\begin{array}{lcl}
 \text{Expr4} & \Rightarrow & \text{Expr4} + \text{Expr3} \\
 & | & \text{Expr} \\
 \\
 \text{Expr3} & \Rightarrow & - \text{Expr3} \\
 & | & \text{Expr} \\
 \\
 \text{Expr2} & \Rightarrow & \text{Expr2} ++ \\
 & | & \text{Expr} \\
 \\
 \text{Expr1} & \Rightarrow & (\text{Expr4}) \\
 & | & \text{Id}
 \end{array}$$

Figure 1: Grammar of expressions with proper precedence and associativity

2.2 Left- and Right-recursive Grammars

$$\begin{array}{lcl}
 \text{Expr4} & \Rightarrow & \text{Expr3 Expr4}' \\
 \text{Expr4}' & \Rightarrow & + \text{Expr4 Expr3} \\
 & | & \epsilon \\
 \\
 \text{Expr3} & \Rightarrow & \text{Expr2 Expr3}' \\
 \text{Expr3}' & \Rightarrow & - \text{Expr3} \\
 & | & \epsilon \\
 \\
 \text{Expr2} & \Rightarrow & \text{Expr1 Expr2}' \\
 \text{Expr2}' & \Rightarrow & ++ \text{Expr2} \\
 & | & \epsilon \\
 \\
 \text{Expr1} & \Rightarrow & \text{Id Expr1}' \\
 \text{Expr1}' & \Rightarrow & (\text{Expr4}) \\
 & | & \epsilon
 \end{array}$$

Figure 2: Right-recursive grammar of expressions with proper precedence and associativity

2.3 Predictive Grammars

$$\begin{array}{ll}
 \text{Start} & \Rightarrow \text{Expr4} \\
 \\
 \text{Expr4} & \Rightarrow \text{Expr3 Expr4 ' } \\
 \text{Expr4 ' } & \Rightarrow + \text{Expr4 Expr3} \\
 & | \epsilon \\
 \\
 \text{Expr3} & \Rightarrow \text{Expr2 Expr3 ' } \\
 \text{Expr3 ' } & \Rightarrow - \text{Expr3} \\
 & | \epsilon \\
 \\
 \text{Expr2} & \Rightarrow \text{Expr1 Expr2 ' } \\
 \text{Expr2 ' } & \Rightarrow ++ \text{Expr2} \\
 & | \epsilon \\
 \\
 \text{Expr1} & \Rightarrow \text{Id Expr1 ' } \\
 \text{Expr1 ' } & \Rightarrow (\text{Expr4}) \\
 & | \epsilon
 \end{array}$$

Figure 3: Right-recursive grammar of expressions with proper precedence and associativity

2.4 Recursive-descent Parsing