

第 2 章 高级语言及其语法描述

6. (1) $L(G_6) = \{0, 1, 2, \dots, 9\}^+$

(2) 最左推导:

$N \Rightarrow ND \Rightarrow NDD \Rightarrow NDDD \Rightarrow DDDD \Rightarrow ODDD \Rightarrow O1DD \Rightarrow O12D \Rightarrow O127$

$N \Rightarrow ND \Rightarrow DD \Rightarrow 3D \Rightarrow 34$

$N \Rightarrow ND \Rightarrow NDD \Rightarrow DDD \Rightarrow 5DD \Rightarrow 56D \Rightarrow 568$

最右推导:

$N \Rightarrow ND \Rightarrow N7 \Rightarrow ND7 \Rightarrow N27 \Rightarrow ND27 \Rightarrow N127 \Rightarrow D127 \Rightarrow O127$

$N \Rightarrow ND \Rightarrow N4 \Rightarrow D4 \Rightarrow 34$

$N \Rightarrow ND \Rightarrow N8 \Rightarrow ND8 \Rightarrow N68 \Rightarrow D68 \Rightarrow 568$

7. $G: S \rightarrow ABC \mid AC \mid C$

$A \rightarrow 1 \mid 2 \mid 3 \mid 4 \mid 5 \mid 6 \mid 7 \mid 8 \mid 9$

$B \rightarrow BB \mid 0 \mid 1 \mid 2 \mid 3 \mid 4 \mid 5 \mid 6 \mid 7 \mid 8 \mid 9$

$C \rightarrow 1 \mid 3 \mid 5 \mid 7 \mid 9$

8. (1) 最左推导:

$E \Rightarrow E+T \Rightarrow T+T \Rightarrow F+T \Rightarrow i+T \Rightarrow i+T^*F \Rightarrow i+F^*F \Rightarrow i+i^*F \Rightarrow i+i^*i$

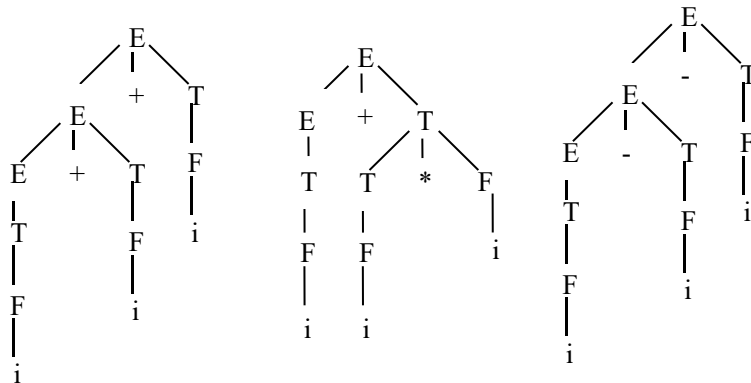
$E \Rightarrow T \Rightarrow T^*F \Rightarrow F^*F \Rightarrow i^*F \Rightarrow i^*(E) \Rightarrow i^*(E+T) \Rightarrow i^*(T+T) \Rightarrow i^*(F+T) \Rightarrow i^*(i+T) \Rightarrow i^*(i+F) \Rightarrow i^*(i+i)$

最右推导:

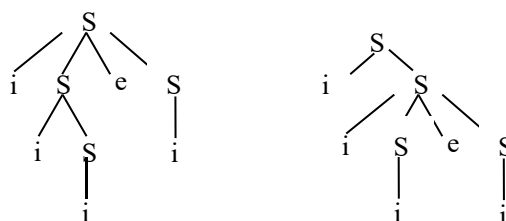
$E \Rightarrow E+T \Rightarrow E+T^*F \Rightarrow E+T^*i \Rightarrow E+F^*i \Rightarrow E+i^*i \Rightarrow T+i^*i \Rightarrow F+i^*i \Rightarrow i+i^*i$

$E \Rightarrow T \Rightarrow T^*F \Rightarrow T^*(E) \Rightarrow T^*(E+T) \Rightarrow T^*(E+F) \Rightarrow T^*(E+i) \Rightarrow T^*(T+i) \Rightarrow T^*(F+i) \Rightarrow T^*(i+i) \Rightarrow F^*(i+i) \Rightarrow i^*(i+i)$

(2)



9. 证明: 该文法存在一个句子 $iiiei$ 有两棵不同语法分析树, 如下所示, 因此该文法是二义的。



11.

G1:

$S \rightarrow AB$

$A \rightarrow aAb \mid ab$

$B \rightarrow cB \mid \varepsilon$

G2:

$S \rightarrow AB$

$A \rightarrow aA \mid \varepsilon$

$B \rightarrow bBc \mid bc$

G3:

$S \rightarrow AA$

$A \rightarrow aAb \mid \varepsilon$

G4:

$S \rightarrow 1S0 \mid A$

$A \rightarrow 0A1 \mid \varepsilon$