

编译原理 第二周作业 9月24日 周四

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3.1 考虑文法：

$$S \rightarrow (L) \mid a$$

$$L \rightarrow L, S \mid S$$

(b) 建立句子 $(a, (a, a))$ 和 $(a, ((a, a), (a, a)))$ 的最左推导。

解：对其进行最左推导：

$(a, (a, a))$:

$$\begin{aligned} S &\Rightarrow (L) \Rightarrow (L, S) \Rightarrow (L, (L)) \Rightarrow (L, (L, S)) \Rightarrow (L, (S, S)) \\ &\Rightarrow (S, (S, S)) \Rightarrow (a, (S, S)) \Rightarrow (a, (a, S)) \Rightarrow (a, (a, a)) \end{aligned}$$

$(a, ((a, a), (a, a)))$:

$$\begin{aligned} S &\Rightarrow (L) \Rightarrow (L, S) \Rightarrow (L, (L)) \Rightarrow (S, (L)) \Rightarrow (S, (L, S)) \\ &\Rightarrow (S, (S, S)) \Rightarrow (S, ((L, S), S)) \Rightarrow (S, ((L, (L, S)), S)) \Rightarrow (S, ((L, S), (L, S))) \\ &\Rightarrow (S, ((L, S), (L, S))) \Rightarrow (S, ((S, S), (L, S))) \Rightarrow (S, ((S, S), (S, S))) \\ &\Rightarrow (a, ((S, S), (S, S))) \Rightarrow (a, ((a, S), (S, S))) \Rightarrow (a, ((a, a), (S, S))) \\ &\Rightarrow (a, ((a, a), (a, S))) \Rightarrow (a, ((a, a), (a, a))) \end{aligned}$$

3.3 下面的二义文法描述命题演算公式，为它写一个等价的非二义文法。

$$S \rightarrow S \text{ and } S \mid S \text{ or } S \mid \text{not } S \mid \text{true} \mid \text{false} \mid (S)$$

解：根据运算的优先级即可构造等价的非二义文法：

$$S \rightarrow S \text{ or } A$$

$$A \rightarrow A \text{ and } B$$

$$B \rightarrow \text{not } B \mid \text{true} \mid \text{false} \mid (S)$$

运算优先级：非>与>或