编译原理作业 (5)

姓名： _____ **学号：** _____

2024 年 04 月 28 日

请独立完成作业，不得抄袭。
若得到他人帮助, 请致谢。
若参考了其它资料，请给出引用。
鼓励讨论，但需独立书写解题过程。

Semantics of Context-Free Languages

by

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ABSTRACT

"Meaning" may be assigned to a string in a context-free language by defining "attributes" of the symbols in a derivation tree for that string. The attributes can be defined by functions associated with each production in the grammar. This paper examines the implications of this process when some of the attributes are "synthesized", i.e., defined solely in terms of attributes of the *descendants* of the corresponding nonterminal symbol, while other attributes are "inherited", i.e., defined in terms of attributes of the *ancestors* of the nonterminal symbol. An algorithm is given which detects when such semantic rules could possibly lead to circular definition of some attributes. An example is given of a simple programming language defined with both inherited and synthesized attributes, and the method of definition is compared to other techniques for formal specification of semantics which have appeared in the literature.

1 作业 (必做部分)

题目 1
考虑如下文法 G,

$$S \to L.L \mid L$$
$$L \to LB \mid B$$
$$B \to 0 \mid 1$$

请设计语法制导的翻译方案, 计算 S 产生的二进制小数对应的十进制值。如, $101.101_2 = 5.625_{10}$。你需要自行定义合适的属性。

解答：

题目 2
考虑如下文法 G,

$$S \to (L) \mid a$$
$$L \to L, S \mid S$$

请设计语法制导的翻译方案, 完成下列任务。你需要自行定义合适的属性。

(1) 计算每个 a 的嵌套深度。例如, 在句子 $(a,(a,a))$ 中, 每个 a 的嵌套深度分别为 $1,2,2$。

(2) 计算每个 a 的位置。例如, 在句子 $(a,(a,(a,a),(a)))$ 中, 每个 a 的位置分别为 $2,5,8,10,14$。

解答:

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2 反馈

你可以写

- 对课程及教师的建议与意见
- 教材中不理解的内容
- 希望深入了解的内容
- $\cdots$