Tutorial 9

COMP 335: Introduction to Theoretical Computer Science

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Outline

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Proving Ambiguity

Recipe

Show that there are 2 more *unique* parse trees for a string w in the language. In order to insure uniqueness, use either leftmost derivation or right most derivation[a].

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[a]This pdf provides a good source for further tips on this topic.

Leftmost Derivation vs Rightmost Derivation

Question 1

Do the leftmost derivation and rightmost derivation parse trees for the string *aba* in the following grammar lead to the same parse tree?

$$S \rightarrow SS|a|b$$

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Derivation Trees

Question 1

1. Show that the following grammar is ambiguous.
2. Give an unambiguous grammar with the same language.

$$
\begin{aligned}
S &\rightarrow A|B \\
A &\rightarrow 0S|\lambda \\
B &\rightarrow 1S|\lambda
\end{aligned}
$$

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Derivation Trees

Question 2

1. Show that the following grammar is ambiguous.

2. Give an unambiguous grammar with the same language.

$$S \rightarrow S1 \mid 00S1 \mid 1$$