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CS 321 Assignment 5

Section 5.1 (Question 1):

The context free grammar for the language L = ($a^x b^y c^z$: z = x + y} can be represented by the following.

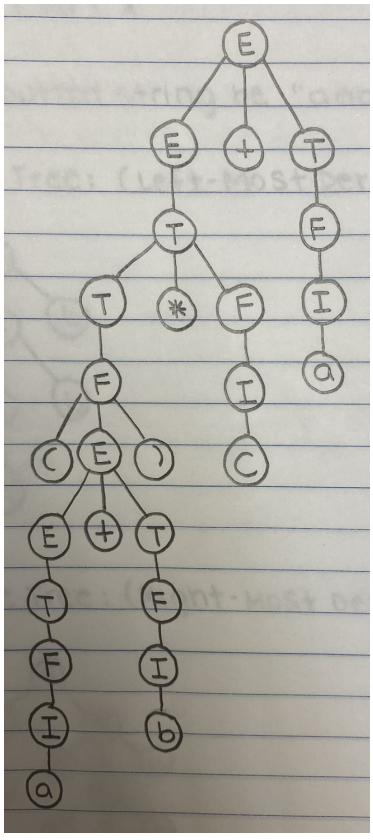
S → aSc | A
A → bAc | ε

Section 5.1 (Question 2):

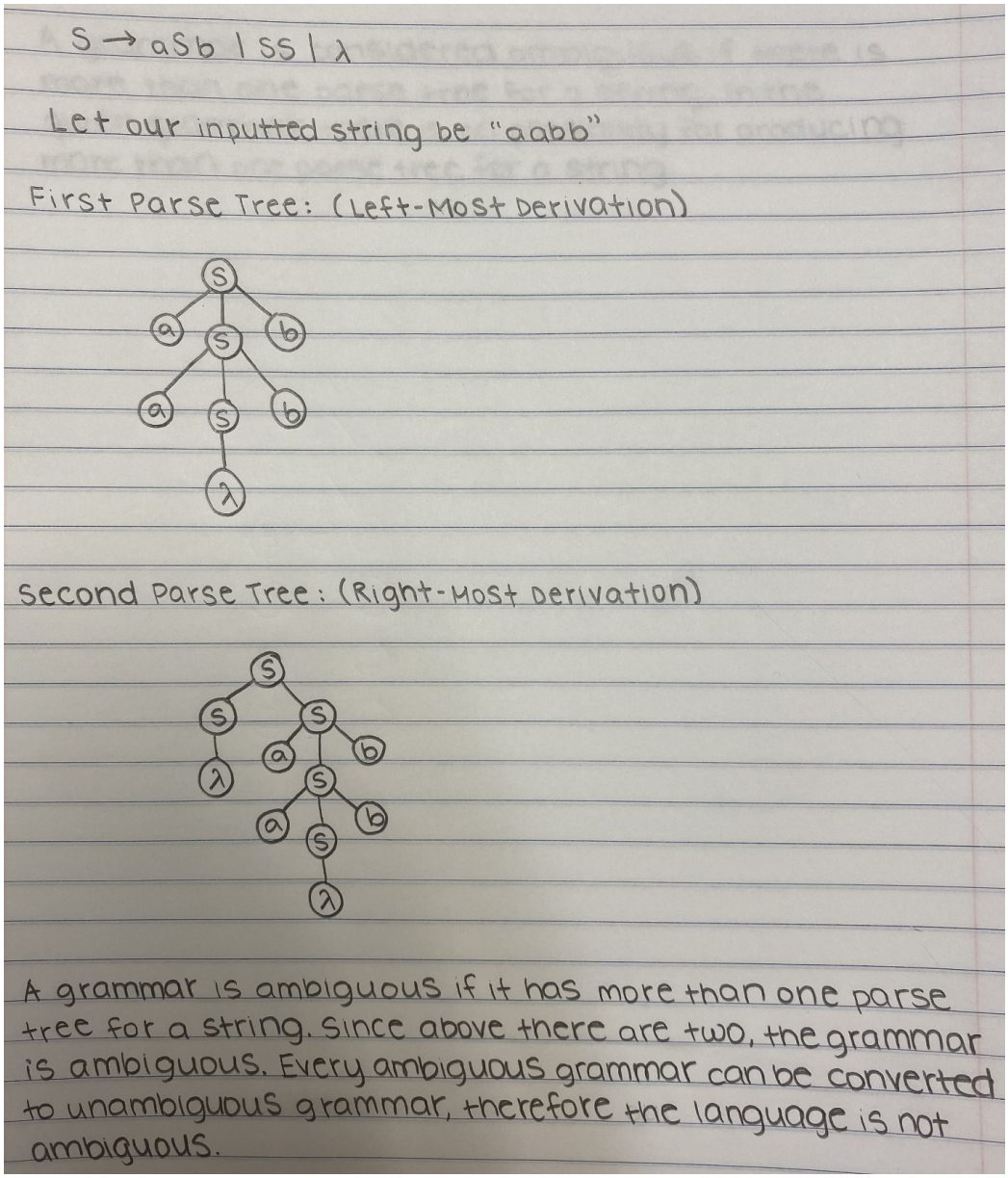
The context free grammar for the language L = ($a^n b^n$: n is not a multiple of 3} can be represented by the following.

S → aaaSbbb | ab | aabb

Section 5.2 (Question 3):



Section 5.2 (Question 4):



Section 5.2 (Question 5):

A grammar is considered ambiguous if there is more than one parse tree for a string. In the provided grammar from the prompt, there is no possibility for producing more than one parse tree for any given string. This is due to the fact that there is no variable on the right-hand side. Because of this, there is no production possible after the first step. Also, due to the fact that there is only one start symbol, there is no possibility of generating more than one parse tree from the provided grammar. Therefore, even if there are more

than one parse tree that can be produced from the grammar, the language can only be satisfied by the symbol produced by the start symbol. Due to the fact that there is no variable on the right-hand side of the grammar, there exists no possibility of moving past the initial production. Thus providing that the grammar will always be ambiguous.