CS332: Module 9 HW09

1. (5 pts) Let Σ = {a, b}, and L be the language that contains strings that do not contain exactly three a's in sequence. Examples of strings in L: baab, baaaab (4 a's in a row), bbabaabaaaab. Examples of strings not in L: aaa, baaab, bababaaabab (all of them have three a's in a row somewhere). Create a grammar, G, for L.

S → A

A → bA

A → aaC

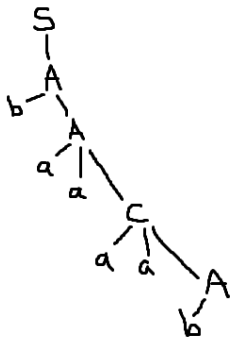
A → aB

A → λ

B → aaaA

C → aaA

2. (10 pts) draw the parse tree for string u = baaaab



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3. (5 pts) State, with justification, whether your grammar is ambiguous or not.

The language I designed is ambiguous as proven by the fact that there exists multiple possible, valid, parse trees for the string given in number 2 (u = baaaab). To further prove this, I constructed another parse tree, below, for number 2.