CSC 340: Programming Language and Compilation
Exercises : Context Free Grammar

Exercise 4.2.1 and 4.2.2 in (*)

Consider each following context-free grammars:

1- $S \rightarrow$ 0 S 1 | 0 1 **with string 000111.**
2- $S \rightarrow$ S S + | S S * | a **with the input string aa + a*.**
3- $S \rightarrow$ S + S|S S|(S)|S* | a **with string (a + a) * a.**

And apply the following:

A. **Give a leftmost derivation for the string.**
B. **Give a rightmost derivation for the string.**
C. **Give a parse tree for the string.**
D. **is the grammar ambiguous or unambiguous? Justify your answer.**
E. **Describe the language generated by this grammar.**

(*) Book: "Compilers Principles, techniques, & tools", Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffry D. Ullman