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CS 370 4a Problems

Problem 4.2.2.c page 207: Repeat Exercise 4.2.1 for each of the following grammars and strings:
  C) S -> S (S) S | e with string (()())

Here is what 4.2.1 is asking for:
i) Give a leftmost derivation for the string.
ii) Give a rightmost derivation for the string.
iii) Give a parse tree for the string.
iV) Is the grammar ambiguous or unambiguous? Justify your answer.
V) Describe the language generated by this grammar.

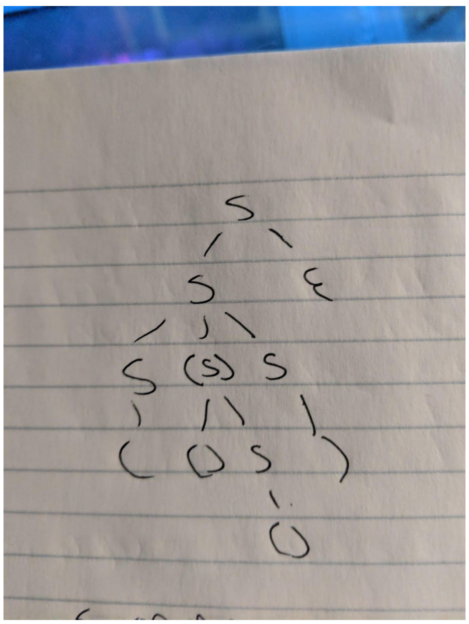
Problem 4.2.3.a page 207: Design grammars for the following languages:
  A) The set of all strings of 0s and 1s with an equal number of 0s and 1s.

Problem 4.4.1.c Page 231: For each of the following grammars, devise predictive parsers and show the parsing tables. You may left-factor and/or eliminate left-recursion from your grammars first.
  c) The grammar of Exercise 4.2.2(c).

4.2.2.c) S -> S (S) S I e with string (()()).

1) Left Most:
   S(S)S
   (S)S
   (S(S)S)S
   ((S)S)S
   (()S)S
   (()S(S)S)S
   (()(S)S)S
   (()()S)S
   (()())S
   (()())

2) Right Most:
   S(S)S
   (S)S
   S(S(S)S)
   S(S(S))
   S(S())
   S(S(S)S())
   S(S(S)())
   S(S()())
   S(()())
   (()())

3) 

4) This is an ambiguous grammar.
5) The language generated by this grammar is the set of strings of symmetrical parentheses.

4.2.3.a) The set of all strings of Os and Is such that every 0 is immediately followed by at least one 1.

   S -> (0?1)*

4.4.1.c) S -> S (S) S | e

1) Does not have a left common factor.
2) Remove the left recursion:
   S -> A

A -> (S) S A | e

3) Parsing Table:

	(	)	$
S	S -> A	S -> A	S -> A
A	A -> (S) S A A -> e	A -> e	A -> e