Lab 4

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1 Crafting a Compiler Exercises

1.1 Chapter 4.9

Compute FIRST and FOLLOW sets for non-terminals of the following grammar.

First and Follow set is as follows:

Production	Nullable?	FIRST	FOLLOW
S	No	{a, b, c, d}	{$, e}
B	No	{b, c, d}	{e}
C	No	{d, c}	{e}

1.2 Chapter 5.10

Show the two distinct parse trees that can be constructed for [if expr then if expr then other else other] using the grammar given in Figure 5.17. For each parse tree, explain the correspondence of then and else.

Parse tables are shown below.

Note that for the first parse tree, it assumes an expansion from the first Stmt encountered in the grammar, directly after the first "then" statement. For the second parse tree, it assumes the second set in Stmt in the grammar, which has a "then" statement but no corresponding "else" statement to catch our second Stmt call.

2 Dragon Book

2.1 Chapter 4.4.3

Compute a FIRST and FOLLOW set for the grammar in Exercise 4.2.1

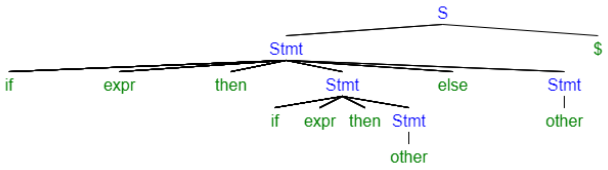

Figure 1.1: First parse tree

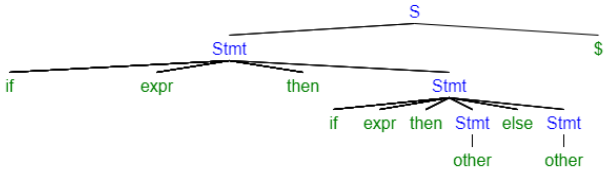

Figure 1.2: Second parse tree

First and Follow set is as follows:

Production	Nullable?	FIRST	FOLLOW
S	No	{a}	{a,*,$}