Lab 4

CMPT 432 - Spring 2023 | Dr. Labouseur

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1 Crafting a Compiler

1.1 Exercise 4.9

Compute the First and Follow sets for the nonterminals of the following grammar:

1. S -> a S e
2. | B
3. B -> b B e
4. | C
5. C -> c C e
6. | d

S: first set = {a, b, c, d}, follow set = {$, e}
B: first set = {b, c, d}, follow set = {e, $}
C: first set = {c, d}, follow set = {e, $}

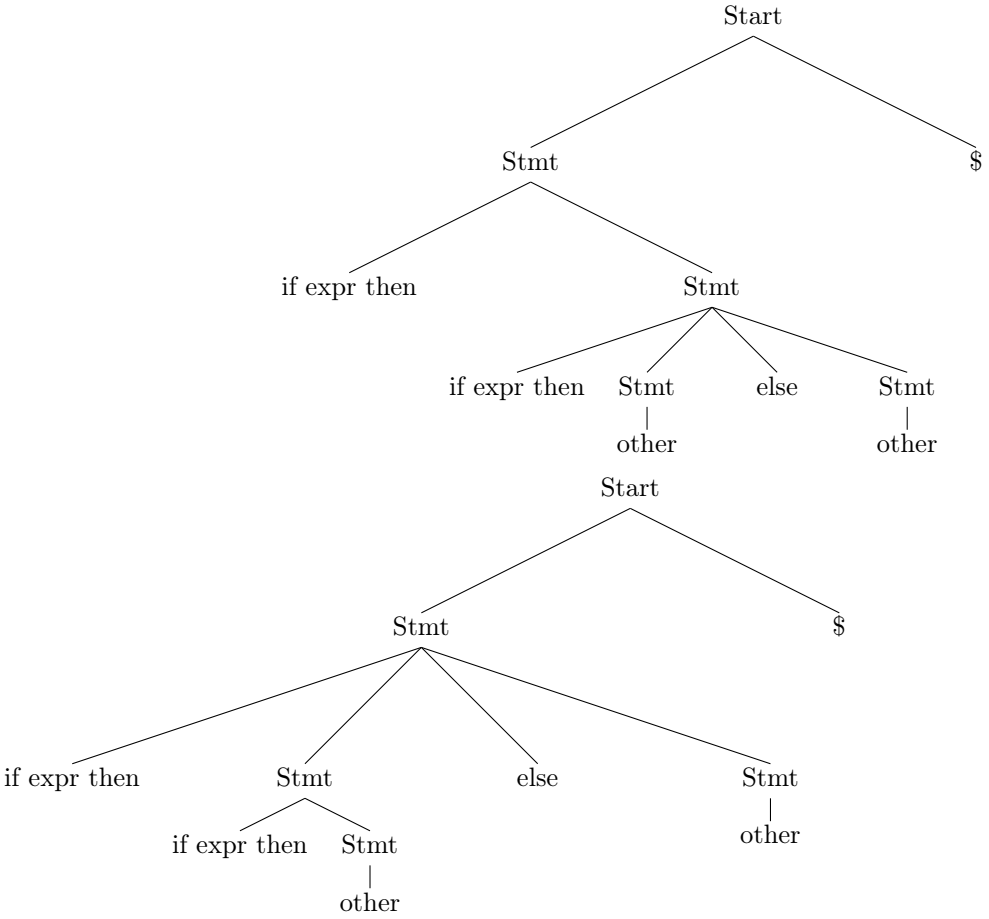
Nonterminal	a	b	c	d	e
S	#1	#2	#2	#2	
B		#3	#4	#4	
C				#5	#6

1.2 Exercise 5.10

Show 2 distinct parse trees that can be constructed for: if expr then if expr then other else other

1. S -> Stmt $
2. Stmt –> if expr then Stmt else Stmt
3. | if expr then Stmt
4. | other

The 2 trees are below. The important difference between them is which if statement does the else pair up with. In the first tree, the else pairs with the most recent if and the second subtree pairs the else with the outer if.



2 Dragon

Compute first and follow sets for the following grammar:

1. S –> S S +
2. | S S *
3. | a

First(S) = {a} Follow(S) = {+, *, $, a}