Lab 4

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1 Crafting a Compiler, Chapter 4, Exercise 4.7

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

1. S → aSe
2. | B
3. B → bBe
4. | C
5. C → cCe

6 | d

	null?	first	follow	a	b	c	d	e
S	no	{ae,be,ce,d}	{ce,ae,be}	2	2	2	1	3
B	no	{be,ce,d}	{be,ce,ae}	1	2	2	1	5
C	no	{ce,d}	{d,ae,be,ce}	1	1	2	2	4

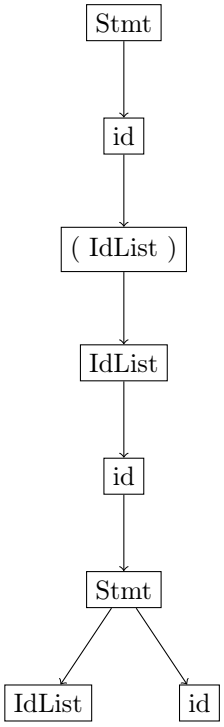
2 Crafting a Compiler, Chapter 5, Exercise 5.10

Show the two distinct parse trees that can be constructed for

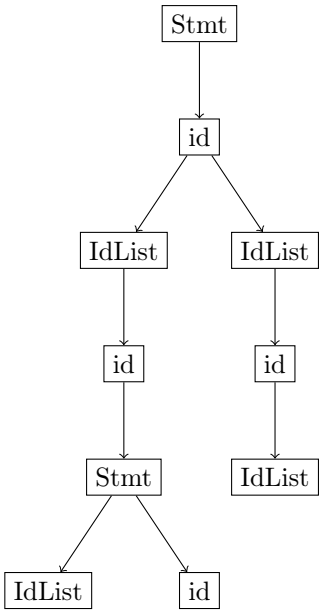
if expr then if expr then other else other

Parse tree:

From - http://www.texample.net/tikz/examples/tree/



Parse tree # 2:



For each tree, the correspondence of then and else signifies where the parser can look ahead, meaning they ultimately lead to the parser's discovery.

3 Dragon Book, chapter 4, exercise 4.4.3

Compute FIRST and FOLLOW for the grammar of Exercise 4.2.1:

$5 \rightarrow$ S S + S S* a

	null?	first	follow	a	+	*
S	no	{a}	{a, +, *}	3	1	1