

Crafting a Compiler

4.9

Compute First and Follow sets for the non-terminals of the following grammar

1. $S \rightarrow a S e$
2. $| B$
3. $B \rightarrow b B e$
4. $| C$
5. $C \rightarrow c C e$
6. $| d$

First Sets

$S \Rightarrow c, d, b, a$

$B \Rightarrow c, d, b$

$C \Rightarrow c, d$

Follow Sets

$S \Rightarrow e, \$$

$B \Rightarrow e$

$C \Rightarrow e$

5.10

1. $S \rightarrow \text{Stmt } \$$
2. $\text{Stmt} \rightarrow \text{if expr then Stmt else Stmt}$
3. $| \text{if expr then Stmt}$
4. $| \text{other}$

if expr then if expr then other else other

Parse Trees:

Leftmost derivation:

S

1. Stmt \$
2. if expr then Stmt else Stmt
3. if expr then if expr then Stmt else Stmt
4. if expr then if expr then other else Stmt
4. if expr then if expr then other else other

Rightmost derivation:

S

1. Stmt
2. if expr then Stmt else Stmt

4. if expr then Stmt else other
3. if expr then if expr then Stmt else other
4. if expr then if expr then other else other

Dragon

4.4.3

Compute FIRST and FOLLOW for the grammar of Exercise 4.2.1.

$S \rightarrow S S + \mid S S * \mid a$

First Set:

$S \Rightarrow a$

Follow Set:

$S \Rightarrow +, *, a, \$$