Construction of the Set of Nullable Variables

input: context-free grammar $G = (N, T, P, S)$

1. NULL := $\{ A \mid A \rightarrow \lambda \in P \}$

2. REPEAT

    2.1. PREV := NULL

    2.2. for each variable $A \in N$ do

           if there is an A rule $A \rightarrow w$ and $w \in$ PREV* then

                NULL := NULL $\cup \{ A \}$

3. UNTIL NULL = PREV

Construction of the Set of CHAIN(*A*)

input: essentially noncontracting context-free grammar $G = (N, T, P, S)$

4. CHAIN(A) := $\{ A \}$

5. PREV := $\varnothing$

6. REPEAT

    6.1. NEW := CHAIN(A) – PREV

    6.2. PREV := CHAIN(A)

    6.3. for each variable $B \in$ NEW do

           for each rule $B \rightarrow C$ do

                CHAIN(A) := CHAIN(A) $\cup \{ C \}$

7. UNTIL CHAIN(A) = PREV

Ref: Sudkamp, Thomas A., *Languages and Machines*. 2 ed. Addison-Wesley, 1997