2.2. GRAMÁTICAS REGULARES LINEALES POR LA DERECHA (GRLD)

DEFINICIÓN

$G = (N, \Sigma, P, S)$

$P \subseteq N \times \Sigma^* (N \cup \varepsilon)$

$$\left.\begin{matrix} A \rightarrow \omega B \\ A \rightarrow \omega \end{matrix}\right\} \in P \qquad \begin{matrix} A, B \in N \\ \omega \in \Sigma^* \end{matrix}$$

2.2.1. UNIÓN

$$\begin{matrix} G_1 = (N_1, \Sigma_1, P_1, S_1) \\ G_2 = (N_2, \Sigma_2, P_2, S_2) \end{matrix} \quad N_1 \cap N_2 = \emptyset \Rightarrow G = (N, \Sigma, P, S) \text{ donde } \begin{cases} N = N_1 \cup N_2 \cup \{S\} \\ \Sigma = \Sigma_1 \cup \Sigma_2 \\ P = P_1 \cup P_2 \cup \{S \rightarrow S_1 \mid S_2\} \end{cases}$$

$L(G) = L(G_1) \cup L(G_2)$

2.2.2. FORMA NORMAL

$G = (N, \Sigma, P, S)$

$P \subseteq N \times (\Sigma N \cup \varepsilon)$

$$\left.\begin{array}{l} A \rightarrow \sigma B \\ A \rightarrow \varepsilon \end{array}\right\} \in P \qquad \begin{array}{c} A, B \in N \\ \sigma \in \Sigma \end{array}$$

a) Eliminar Producciones Unitarias

Producción Unitaria
$A \rightarrow B \qquad A, B \in N$

$$G = (N, \Sigma, P, S) \quad \Rightarrow \quad G' = (N, \Sigma, P', S)$$
$$\left.\begin{array}{l} A \rightarrow B \\ B \rightarrow \alpha \end{array}\right\} \in P \quad \Rightarrow \quad \left.\begin{array}{l} A \rightarrow \alpha \\ B \rightarrow \alpha \end{array}\right\} \in P'$$

$$U(A) = \left\{ B \in N \;/\; A \overset{*}{\Rightarrow} B \right\} \qquad \forall A \in N$$

Algoritmo:
P’ = $\emptyset$
$\forall$ A $\in$ N
  $\forall$ B $\in$ U(A)
    $\forall$ B $\rightarrow \alpha \in$ P
      Si $\alpha \notin$ N entonces
        P’ = P’ $\cup$ {A $\rightarrow \alpha$}
      Fin Si

b)
$$G = (N, \Sigma, P, S) \quad \Rightarrow \quad G' = (N', \Sigma, P', S)$$

$$A \rightarrow \sigma_1\sigma_2\sigma_3 \cdots \sigma_n B \in P \quad n > 1 \quad \Rightarrow \quad \left.\begin{array}{l} A \rightarrow \sigma_1 D_1 \\ D_1 \rightarrow \sigma_2 D_2 \\ D_2 \rightarrow \sigma_3 D_3 \\ D_3 \rightarrow \sigma_4 D_4 \\ \cdots \\ D_{n\text{-}2} \rightarrow \sigma_{n\text{-}1} D_{n\text{-}1} \\ D_{n\text{-}1} \rightarrow \sigma_n B \end{array}\right\} \in P'$$

$$N' = N \cup \{D_1, D_2, D_3, \cdots, D_{n\text{-}1}\}$$

c)

$$G = (N, \Sigma, P, S) \quad \Rightarrow \quad G' = (N', \Sigma, P', S)$$

$$A \to \sigma_1\sigma_2\sigma_3 \cdots \sigma_n \in P \quad n > 1 \quad \Rightarrow \quad \left.\begin{array}{l} A \to \sigma_1 D_1 \\ D_1 \to \sigma_2 D_2 \\ D_2 \to \sigma_3 D_3 \\ D_3 \to \sigma_4 D_4 \\ \cdots \\ D_{n\text{-}1} \to \sigma_n D_n \\ D_n \to \varepsilon \end{array}\right\} \in P'$$

$$N' = N \cup \{D_1, D_2, D_3, \cdots, D_n\}$$

Ejemplo:
G = ({S, A, B}, {a, b}, P, S)
P = {
S → aB | bA | ε
A → abaS
B → babS
}