$G:\begin{cases} E \to TE' \\ E' \to +TE' \mid -TE' \mid \lambda \\ T \to FT' \\ T' \to *FT' \mid /FT' \mid \lambda \\ F \to (E) \mid a \mid b \mid c \end{cases}$ $G' \approx G$ fără regula de stergere

$\cup_f = \{E', T'\}$

$G':\begin{cases} E \to TE' \mid T \\ E' \to +TE' \mid +T \mid -TE' \mid -T \\ T \to FT' \mid F \\ T' \to *FT' \mid *F \mid /FT' \mid /F \\ F \to (E) \mid a \mid b \mid c \end{cases}$

$p = b/b*(c-a+a*c/(a-b))-a*c \in L(G)$.

$\begin{cases} E \to TE' \\ E' \to +TE' \mid -TE' \mid \lambda \end{cases}$ $\begin{cases} T \to FT' \\ T' \to *FT' \mid /FT' \mid \lambda \end{cases}$

$E \Rightarrow TE' \Rightarrow T-TE' \Rightarrow T-T+TE' \Rightarrow T-T+T+TE' \Rightarrow \overrightarrow{T-T+T+T}$

$T \Rightarrow FT' \Rightarrow F*FT' \Rightarrow F*F/FT' \Rightarrow F*F/F/FT' \Rightarrow \overrightarrow{F*F/F/F}$

$G:\begin{cases} E \to TE' \\ E' \to +TE' \mid -TE' \mid \lambda \\ T \to FT' \\ T' \to *FT' \mid /FT' \mid \lambda \\ F \to (E) \mid a \mid b \mid c \end{cases}$

$E \Rightarrow TE' \Rightarrow T-TE' \Rightarrow T-T \Rightarrow$

$\Rightarrow FT'-T \Rightarrow F/FT'-T \Rightarrow F/F*FT'-T \Rightarrow F/F*F-T \Rightarrow$

$\Rightarrow F/F*F-FT' \Rightarrow F*F/F*F-F*FT' \Rightarrow F/F*F-F*F \Rightarrow$

$\Rightarrow b/F*F-F*F \Rightarrow b/b*F-F*F \Rightarrow b/b*F-a*F \Rightarrow$

$\Rightarrow b/b*F-a*c \Rightarrow b/b*(E)-a*c$

Detaliem producerea expresiei din paranteză

$E \Rightarrow TE' \Rightarrow T-TE' \Rightarrow T-T+TE' \Rightarrow T-T+T \overset{*}{\Rightarrow} F-T+T \Rightarrow$

$\Rightarrow c-T+T \overset{*}{\Rightarrow} c-F+T \Rightarrow c-a+T \Rightarrow c-a+FT' \Rightarrow$

$\Rightarrow c-a+F*FT' \Rightarrow c-a+F*F/FT' \Rightarrow c-a+F*F*F/F \Rightarrow$

$\Rightarrow c-a+a*F/F \Rightarrow c-a+a*c/F \Rightarrow$

$\Rightarrow c-a+a*c/(E) \Rightarrow$

$\Rightarrow c-a+a*c/(TE') \Rightarrow c-a+a*c/(T-TE') \Rightarrow$

$\Rightarrow c-a+a*c/(T-T) \overset{*}{\Rightarrow} c-a+a*c/(F-F) \Rightarrow$

$\Rightarrow c-a+a*c/(a-F) \Rightarrow p$

$p = \underline{b/b*(c-a+a*c/(a-b))} - \underline{\bar{a}*\bar{c}} \in L(G)$

$L_1 = \{a^i b \mid i \geq 0\}$ $L_2 = \{bba^i \mid i \geq 0\}$

$L = L_1 L_2$ $G = ?$ $L(G) = L$

$L = \{a^i b \mid i \geq 0\}\{bba^i \mid i \geq 0\} = \{a^i bbba^i \mid i \geq 0\}$ GREȘIT

$= \{a^i bbba^j \mid i, j \geq 0\}$ CORECT

1) $G: \begin{cases} A \to aA \mid B \\ B \to bbbC \\ C \to aC \mid \lambda \end{cases}$ $L(G) = L$

2) G nu f.n.

a) Eliminăm regulile lungi

$\begin{cases} A \to aA \mid B \\ B \to bbbC \mid bbb \\ C \to aC \mid a \end{cases}$

b) Elim. redun. $A \to B$

$\begin{cases} A \to aA \mid bbbC \mid bbb \\ B \to bbbC \mid bbb \\ C \to aC \mid a \end{cases}$

c) Scurtăm regulile

$\begin{cases} A \to aA \mid bZ_1 \mid bT_1 \\ Z_1 \to bZ_2 \\ Z_2 \to bC \\ T_1 \to bT_2 \\ T_2 \to b \\ B \to bZ_1 \mid bT_1 \\ C \to aC \mid a \end{cases}$ f.n.

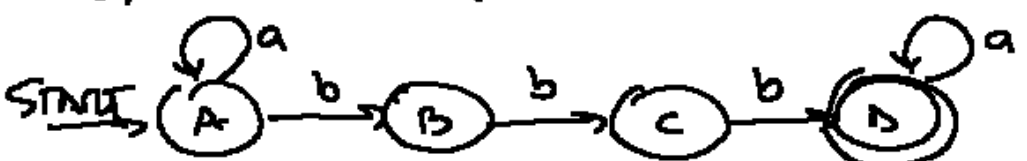
$L_1 = \{a^i b \mid i \geq 0\}$ $L_2 = \{bba^i \mid i \geq 0\}$

$L = L_1 L_2$ $G = ?$ $L(G) = L$

$L = \{a^i b \mid i \geq 0\}\{bba^i \mid i \geq 0\} = \{a^i bbba^i \mid i \geq 0\}$ GREȘIT

$= \{a^i bbba^j \mid i, j \geq 0\}$ CORECT

3) G_r. neambiguă (citesc de pe un AFD)



AFD

G_1:
$A \to aA \mid bB$
$B \to bC$
$C \to bD \mid b$
$D \to aD \mid a$

T.
$\Rightarrow$ G_1 neambiguă

$L_0 = \{ a w a a \tilde{w} \mid w \in \{0,1\}^* \}$

1) G in f.n Chomsky

$a \underline{w} \underline{\underline{aa}} \tilde{w}$.

$$\begin{cases} S \to aX \\ X \to 0X0 \mid 1X1 \mid aa \end{cases}$$

a) Elimin reg sterpere —

b) " $A \to t$ "

$$\begin{cases} S \to X_a X \\ X_a \to a \\ X \to X_0 X X_0 \mid X_1 X X_1 \mid X_a X_a \\ X_0 \to 0 \\ X_1 \to 1 \end{cases}$$

c) Elimin redenumiri —

d) Scurtare regula

$$\begin{cases} S \to X_a X \\ X_a \to a \\ X \to X_0 Z_1 \mid X_1 Z_2 \mid X_a X_a \\ Z_1 \to X X_0 \\ Z_2 \to X X_1 \\ X_0 \to 0 \\ X_1 \to 1 \end{cases}$$

$L_0 = \{ a w a a \tilde{w} \mid w \in \{0,1\}^* \}$

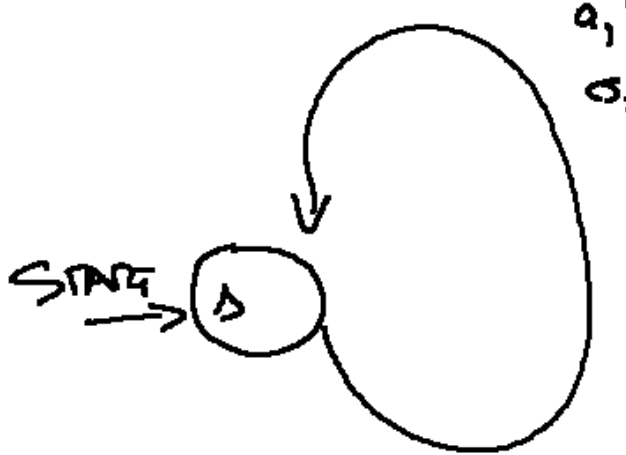
1) G in f.n Chomsky

$a \, w \, aa \, \tilde{w}$.

$$\begin{cases} S \to aX \\ X \to 0X0 \mid 1X1 \mid aa \end{cases}$$

f.n Greibach

$$\begin{cases} S \to aX \mid aXT \mid aXZ \mid aT \\ X \to 0XT \mid 1XZ \mid aT \\ Y \to 0 \\ Z \to 1 \\ T \to a \end{cases}$$



$a, S/X$.
$a, X/XT$.
$1, X/XZ$.
$a, X/T$.
$0, T/\lambda$.
$1, Z/\lambda$.
$a, T/\lambda$.

$p = a1aaa1$

$S \overset{1}{\Rightarrow} aX \overset{3}{\Rightarrow} a1XZ \overset{4}{\Rightarrow} a1aTZ \overset{2}{\Rightarrow} a1aaaZ \overset{5}{\Rightarrow} a1aaa1$

$(q, a1aaa1, S) \vdash (q, 1aaa1, X) \vdash (q, aaa1, XZ) \vdash (q, aa1, TZ) \vdash$
$\vdash (q, a1, Z) \vdash (q, 1, \lambda) \vdash (q, \lambda, \lambda)$

$L = \{ a w a a \tilde{w} \mid w \in \{0,1\}^* \}$

Pornire (recunoaștere fie $w = \lambda$ o facem separat)

$f(s_0, a, z_0) = (s_1, z_0)$

$f(s_1, x, z_0) = (s_1, x z_0) \quad - x \in \{0,1\}$

Rec. $w = \lambda$

$f(s_1, a, z_0) = (s_{55}, z_0)$

$f(s_{55}, a, z_0) = (s_{56}, \lambda)$

Ușure

$f(s_1, x, y) = (s_1, xy) \quad - x, y \in \{a, \lambda\}$

Găsesc mijl (aa)

$f(s_1, a, x) = (s_2, x) \quad x \in \{0,1\}$

$f(s_2, a, x) = (s_3, x) \quad x \in \{0,1\}$

Golire

$f(s_3, x, x) = (s_3, \lambda)$

Recunoaștere $f(s_3, \lambda, z_0) = (s_{10}, \lambda)$

$p = a1aa1$

$(s_0, a1aa1, z_0) \mapsto$

$(s_1, 1aa1, z_0) \mapsto$

$(s_1, aa1, 1z_0) \mapsto$

$(s_2, a1, 1z_0) \mapsto$

$(s_3, 1, 1z_0) \mapsto$

$(s_3, \lambda, z_0) \mapsto (s_{10}, \lambda, \lambda)$