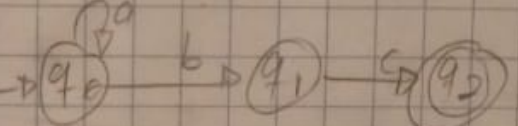
Tarea 16

1.- Construya un AFN que acepte cada uno de los siguientes lenguajes y encuentre una gramática regular que los genere:

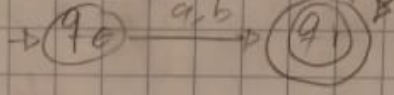
a) $L(G_1) = a^*bc$



$S \to aS \mid bA$
$A \to cB$
$B \to \varepsilon$

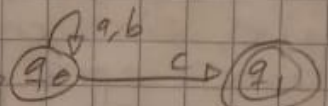
$S \to aS \mid bA$
$A \to c$

b) $L(G_1) = (a \cup b)c^*$



$S \to aA \mid bA$
$A \to cA \mid \varepsilon$

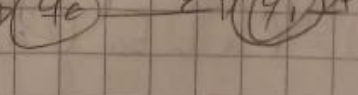
c) $L(G_1) = (a \cup b)^*c$



$S \to aS \mid bS \mid cA$
$A \to \varepsilon$

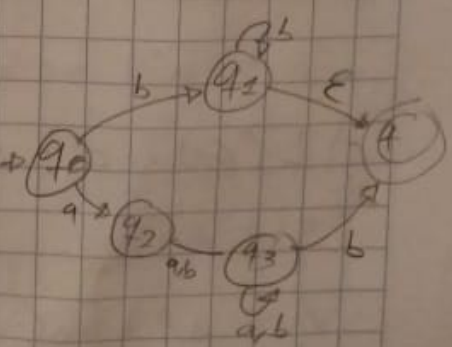
$S \to aS \mid bS \mid c$

d) $L(G_1) = (a \cup b)^* c^*$



$S \to aS \mid bS \mid A$
$A \to cA \mid \varepsilon$

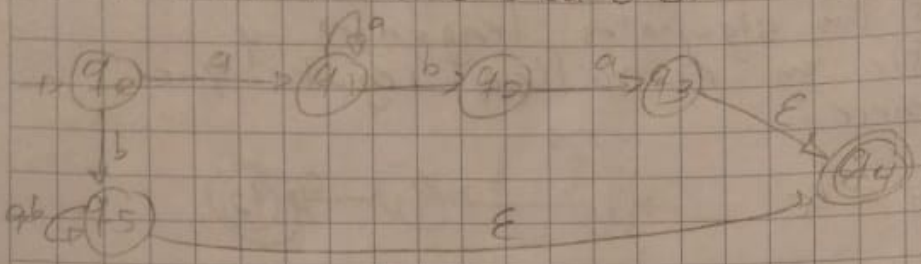
e) $L(G_1) = b^+ \cup a(a \cup b)^+ b$



$S \to A \mid B$
$A \to bC$
$C \to bC \mid \varepsilon$

$B \to aD \mid aD$
$D \to aE \mid bE$
$E \to aE \mid bE \mid b$

f) $L(G) = a^+ba \cup b(a \cup b)^*$



$S \to A \mid B$

$A \to aC$
$C \to aC \mid ba \mid \varepsilon$

$B \to bD$
$D \to aD \mid bD \mid \varepsilon$

2: Obtenga una gramática regular que genere cada uno de los siguientes lenguajes, sin construir el diagrama de transiciones:

a) $L(G_1) = a^*baa$

$S \to aS \mid baa$

b) $L(G_1) = (a \cup ba \cup ac)^*$

$S \to aS \mid baS \mid aaS \mid \varepsilon$

c) $L(G_1) = a^*bc^+ \cup cb^+$

$S \to A \mid B$

$A \to aA \mid bcC$
$C \to cC \mid \varepsilon$

$B \to cbE$
$E \to bE \mid \varepsilon$

d) $L(G) = a^+b(b \cup a)^+$

$S \to aA$
$A \to aA \mid bB \mid$
$B \to bC \mid aC$
$C \to bC \mid aC \mid \varepsilon$

e) $L(G) = b^+a \cup ab(a \cup b)^*$

$S \to A \mid B$

$A \to bC$ $\quad B \to abD$
$C \to bC \mid a$ $\quad D \to aD \mid bD \mid \varepsilon$

3. Encuentre una gramática regular que genere cada uno de los siguientes lenguajes:

a) $L(G) = a^*b(a \cup b)^* \cup ab^+$

$S \to A \mid B$

$A \to aA \mid bD$ $\quad B \to abE$
$D \to aD \mid bD \mid \varepsilon$ $\quad E \to bE \mid \varepsilon$

b) $L(G) = b^*a \cup (a \cup b)^*b$

$S \to A \mid B$

$A \to bA \mid a$ $\quad B \to aB \mid bB \mid b$

c) $L(G_1) = a(a \cup b)^+ b \cup b^*$

$S \to A \mid B$

$A \to aC$ $\quad B \to bB \mid \varepsilon$

$C \to aB \mid bD$

$D \to aD \mid bD \mid b$

d) $L(G_1) = b^* a \cup (a \cup bb)^* aa$

$S \to A \mid B$

$A \to bA \mid a$ $\quad B \to aB \mid bbB \mid aa$

e) $L(G_1) = 1\emptyset^* \cup 1(\emptyset \cup 1)^* \emptyset$

$S \to A \mid B$

$A \to 1D$ $\quad B \to 1C$

$D \to \emptyset D \mid \varepsilon$ $\quad C \to \emptyset C \mid 1C \mid \emptyset$

f) $L(G_1) = \emptyset^* 1\emptyset \cup 1(\emptyset \cup 1)^*$

$S \to A \mid B$

$A \to \emptyset A \mid 1\emptyset$ $\quad B \to 1C$

$C \to \emptyset C \mid 1C \mid \varepsilon$

g) $L(G) = 0^*1(1 \cup 0)^* \cup 01$

$S \to A \mid 01$

$A \to 0A \mid 1D$

$D \to 1D \mid 0D \mid \varepsilon$