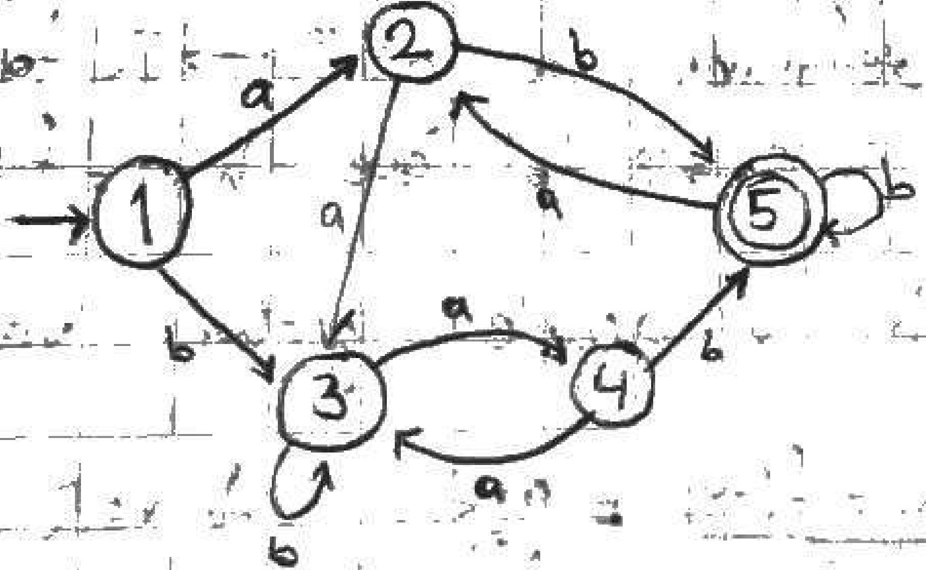
[redacted] González Montiel Luis Fernando

1) a)

M_1



$G_1 = (V_1, T_1, S_1, P_1)$

$V_1 = \{1, 2, 3, 4, 5\}$

$T_1 = \{a, b\}$

$S_1 = \{1\}$

$$P_1 = \begin{cases} 1 \rightarrow a2 \mid b3 \\ 2 \rightarrow b5 \mid a3 \\ 3 \rightarrow a4 \mid b3 \\ 4 \rightarrow a3 \mid b5 \\ 5 \rightarrow a2 \mid b5 \mid \varepsilon \end{cases}$$

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(2) cadena $w = aaabbb$

$S \rightarrow AB \mid XB$
$T \rightarrow AB \mid XB$
$X \rightarrow AT$
$A \rightarrow a$
$B \rightarrow b$

0						
A	1					
∅	A	2				
∅	∅	A	3			
∅	X	S,T	B	4		
X	S,T	∅	∅	B	5	
S,T	∅	∅	∅	∅	B	6

$T_{0,6}$

$\therefore$ como $S \in T_{0,6}$, entonces $w \in L(G)$ ∎

$w = |a|a|a|b|b|b|$
0 1 2 3 4 5 6

$w_{1,5} = aabb$ $\quad w_{0,6} = aaabbb$

$w_{0,1} = a$

$w_{1,2} = a$

$w_{5,6} = b$

Tamaño 1 $\quad w_{0,1}\ w_{1,2}\ w_{2,3}\ w_{3,4}\ w_{4,5}\ w_{5,6}$

Tamaño 2

$w_{0,2} = w_{0,1} w_{1,2}$

$w_{1,3} = w_{1,2}\ w_{2,3}$

$w_{2,4} = w_{2,3}\ w_{3,4} = ab$

$w_{3,5} = w_{3,4}\ w_{4,5}\ \quad w_{4,6} = \ldots$

Tamaño 3

$w_{0,3} = w_{0,1}\ w_{1,3} = w_{0,2}\ w_{2,3}$

$w_{1,4} = w_{1,2}\ w_{2,4} = w_{1,3}\ w_{3,4}$

Tamaño 4

Tres subcadenas de tamaño 4

Tamaño 5

Dos subcadenas

Tamaño 6

Una subcadena

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3) Obtenga el PDA para $L=\{0^n 1^n \mid n \geq 1\}$

$\Sigma = \{0,1\}$ $\Gamma = \{X, Z_0\}$ $Q = \{q_0, q_1, q_2\}$ $F\{q_2\}$

$\delta(q_0, 0, Z_0) = \{(q_0, XZ_0)\}$

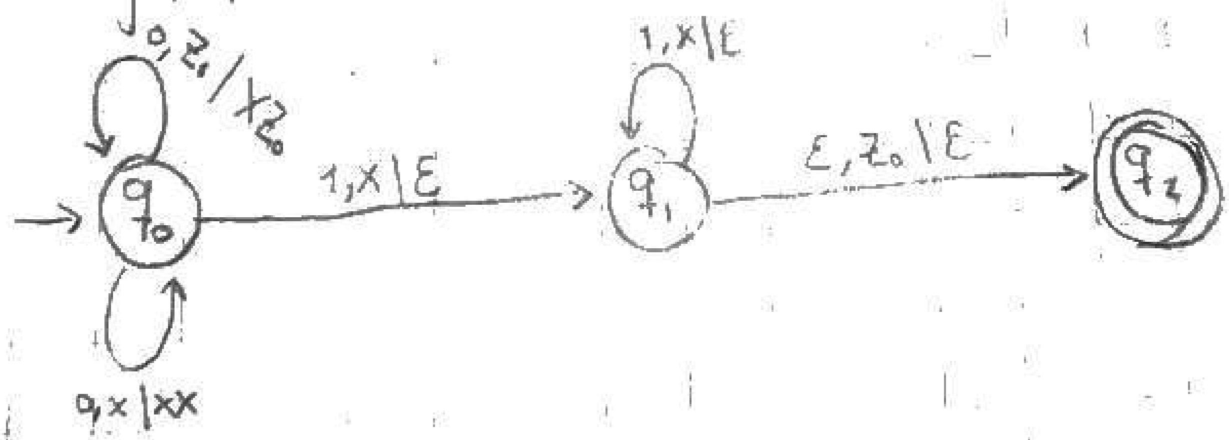
$\delta(q_0, 0, X) = \{(q_0, XX)\}$

$\delta(q_0, 1, X) = \{(q_1, \varepsilon)\}$

$\delta(q_1, 1, X) = \{(q_1, \varepsilon)\}$

$\delta(q_1, \varepsilon, Z_0) = \{(q_2, \varepsilon)\}$

Diagrama de transiciones



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(5) $S \to XSX \mid T$
$T \to aUb \mid bUa$
$U \to XUX \mid X \mid \varepsilon$
$X \to a \mid b$

$M = (Q, \Sigma, \Gamma, \delta, q_0, Z_0, F)$
$Q = \{q\}$
$\Sigma = T = \{a, b\}$
$\Gamma = V \cup T = \{S, T, U, X, a, b\}$
$q_0 = q$, $Z_0 = S$, $F = \emptyset$

$\delta(q, \varepsilon, S) = \{(q, XSX), (q, T)\}$
$\delta(q, \varepsilon, T) = \{(q, aUb), (q, bUa)\}$
$\delta(q, \varepsilon, U) = \{(q, XUX), (q, X), (q, \varepsilon)\}$
$\delta(q, \varepsilon, X) = \{(q, a), (q, b)\}$

$\delta(q, a, a) = \{(q, \varepsilon)\}$
$\delta(q, b, b) = \{(q, \varepsilon)\}$

Consideramos la cadena 'bbaab'

$S \Rightarrow XSX \Rightarrow bSb \Rightarrow bTb \Rightarrow bbUab \Rightarrow bbXab$
$\Rightarrow bbaab$ ✓

Ejecución en M:

$\langle q, bbaab, S\rangle \vdash \langle q, bbaab, XSX\rangle \vdash \langle q, bbaab, bSb\rangle$
$\vdash \langle q, baab, Sb\rangle \vdash \langle q, baab, Tb\rangle$
$\vdash \langle q, baab, bUab\rangle \vdash \langle q, aab, Uab\rangle$
$\vdash \langle q, aab, Xab\rangle \vdash \langle q, aab, aab\rangle$
$\vdash \langle q, ab, ab\rangle \vdash \langle q, b, b\rangle$
$\vdash \langle q, \varepsilon, \varepsilon\rangle$ ✓

$\therefore$ la cadena es aceptada.