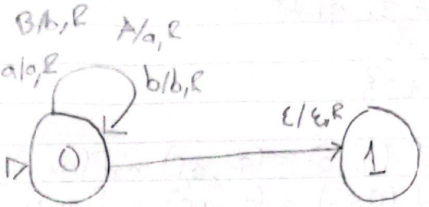
Laboratorio 9

1. $\{a, b, A, B\}$



$Q = \{0, 1\}$
$\Sigma = \{a, b, A, B\}$
$\Gamma = \{a, b, A, B, \varepsilon\}$

$\delta(0, A) = (0, a, R)$
$\delta(0, a) = (0, a, R)$
$\delta(0, B) = (0, b, R)$
$\delta(0, b) = (0, b, R)$
$\delta(0, \varepsilon) = (1, \varepsilon, R)$

Lee el input hacia la derecha buscando A o B

Si encuentra A lo cambia por a, si encuentra B lo cambia por b, en ambos casos sigue en 0.

Si alcanza blank cambia a 1 y se mueve a la derecha

2. $M = (Q, \Sigma, \Gamma, \delta, q_0, q_{halt})$

$Q = \{q_0, q_1, q_{halt}\}$
$\Sigma = \{0, 1\}$
$\Gamma = \{0, 1, B\}$

δ: $\delta(q_0, 0) = (q_0, 0, R)$ ∘ $\delta(q_1, 0) = (q_{halt}, 1, R)$
$\delta(q_0, 1) = (q_0, 1, R)$ ∘ $\delta(q_1, 1) = (q_2, 0, L)$
$\delta(q_0, B) = (q_1, B, L)$ ∘ $\delta(q_1, B) = (q_{halt}, B, L)$

a) 100

$\delta(q_0, 1) = (q_0, 1, R)$
$\delta(q_0, 0) = (q_0, 0, R)$
$\delta(q_0, 0) = (q_0, 0, R)$
$\delta(q_0, B) = (q_1, B, L)$
$\delta(q_1, 0) = (q_{halt}, 1, R)$

$q_0 100 \vdash 1 q_0 00$
$\vdash 10 q_0 0$
$\vdash 100 q_0$
$\vdash 10 q_1 0$
$\vdash 101 q_{halt}$
$\vdash 101$

$q_0 100 \vdash^* 1010$

b) 1001

$\delta(q_0, 1) = (q_0, 1, R)$
$\delta(q_0, 0) = (q_0, 0, R)$
$\delta(q_0, 0) = (q_0, 0, R)$
$\delta(q_0, 1) = (q_0, 1, R)$
$\delta(q_0, 1) = (q_0, 1, R)$
$\delta(q_0, B) = (q_1, B, L)$
$\delta(q_1, 1) = (q_1, 0, L)$

$q_0 1001 \vdash 1 q_0 001$
$\vdash 10 q_0 01$
$\vdash 100 q_0 1$
$\vdash 1001 q_0$
$\vdash 1001 q_1$
$\vdash 100 q_1 10$

$\delta(q_1,1) = (q_1,0,L)$ $\quad \vdash 10q_100$

$\delta(q_1,0) = (q_{halt},1,R)$ $\quad \vdash 101q_{halt}00$

$\vdash 10100$

$q_0 10011 \vdash^* 1010\infty$

c. 11

$\delta(q_0,1) = (q_0,1,R)$ $\quad q_011 \vdash 1q_01$

$\delta(q_0,1) = (q_0,1,R)$ $\quad \vdash 11q_0$

$\delta(q_0,B) = (q_1,B,L)$ $\quad \vdash 1q_11$

$\delta(q_1,1) = (q_1,0,L)$ $\quad \vdash q_110$

$\delta(q_1,1) = (q_1,0,L)$ $\quad \vdash q_1B00$

$\delta(q_1,B) = (q_{halt},B,L)$ $\quad \vdash q_{halt}B00$

$\vdash 00$

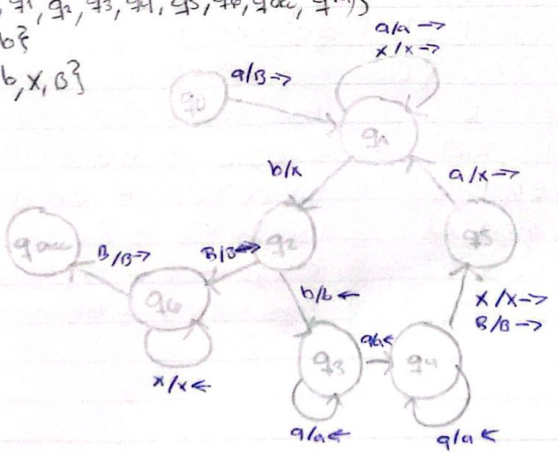
$q_0 11 \vdash^* 00$

3 $M = (Q, \Sigma, \Gamma, q_0, q_{acc}, q_{rej})$

$Q = \{q_0, q_1, q_2, q_3, q_4, q_5, q_6, q_{acc}, q_{rej}\}$

$\Sigma = \{a, b\}$

$\Gamma = \{a, b, X, B\}$



→ q_0

$\delta(q_0, a) = (q_1, B, R)$

→ q_1

$\delta(q_1, a) = (q_1, a, R)$

$\delta(q_1, b) = (q_2, X, R)$

$\delta(q_1, X) = (q_1, X, R)$

→ q_2

$\delta(q_2, b) = (q_3, b, L)$

$\delta(q_2, B) = (q_6, B, L)$

→ q_3

$\delta(q_3, a) = (q_4, a, L)$

$\delta(q_3, X) = (q_3, X, L)$

→ q_4

$(q_4, a) = (q_4, a, L)$

$(q_4, X) = (q_5, X, R)$

$(q_4, B) = (q_3, B, R)$

→ q_5

$(q_5, a) = \delta(q_1, X, R)$

→ q_6

$(q_6, X) = \delta(q_6, X, L)$

$(q_6, B) = (q_{acc}, \sqcup, R)$

$\delta(q_0, a) = (q_1, B, R)$ $q_0aabb \vdash Bq_1abb$

$\delta(q_1, a) = (q_1, a, R)$ $Bq_1abb \vdash Baq_1bb$

$\delta(q_1, b) = (q_2, X, R)$ $Baq_1bb \vdash BaXq_2b$

$\delta(q_2, b) = (q_3, b, L)$ $BaXq_2b \vdash Baq_3Xb$

$\delta(q_3, X) = (q_3, X, L)$ $Baq_3Xb \vdash Bq_3aXb$

$\delta(q_3, a) = (q_0, a, L)$ $Bq_3aXb \vdash q_4BaXb$

$\delta(q_4, B) = (q_5, B, R)$ $q_4BaXb \vdash Bq_5aXb$

$\delta(q_5, a) = \delta(q_1, X, R)$ $Bq_5aXb \vdash BXq_1Xb$

$\delta(q_1, X) = (q_1, X, R)$ $BXq_1Xb \vdash BXXq_1b$

$\delta(q_1, b) = (q_2, X, R)$ $BXXq_1b \vdash BXXXq_2B$

$\delta(q_2, B) = (q_4, B, L)$ $BXXXq_2B \vdash BXXq_4XB$

$\delta(q_0, X) = (q_6, X, L)$ $BXXq_6XB \vdash BXq_6XXB$

$\delta(q_0, X) = (q_6, X, L)$ $BXq_6XXB \vdash Bq_6XXXB$

$\delta(q_6, B) = (q_{acc}, B, R)$ $Bq_6XXXB \vdash BBq_{acc}XXXB$

LENGUAJE

$M = \{a^n b^n \mid n \geq 1\}$

Todas las cadenas de n letras a, seguidas de n letras b si n es ≥ 1

cada a se junta con b, la maquina procesa hasta que no queden a's o b's sin cargar

si hay una b antes de las "a"s, la maquina rechaza el input