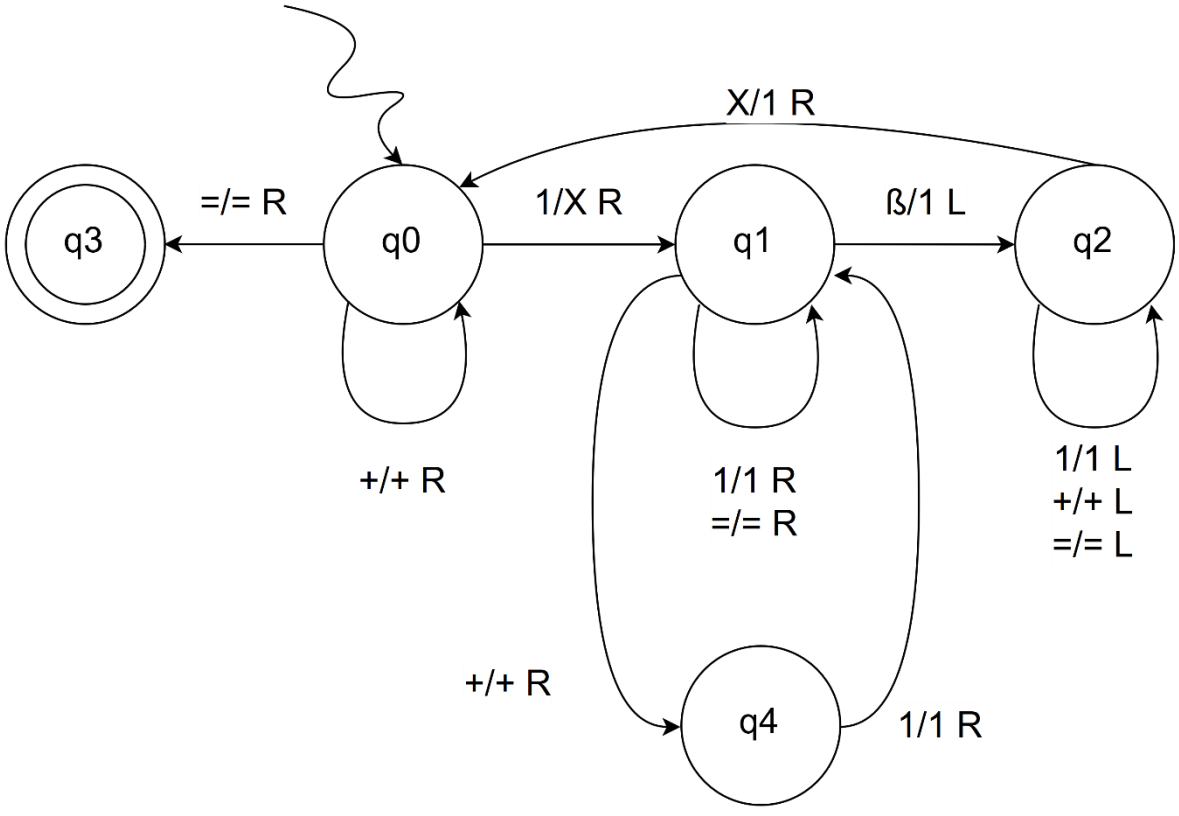
Sumador

$M = (Q, \Sigma, \Gamma, \delta, q_0, ß, F)$

$Q = \{q_0, q_1, q_2, q_3, q_4\}$
$\Sigma = \{1, +, =\}$
$\Gamma = \{1, +, =, X, ß\}$
$F = q_3$

Estados	Símbolos				
	1	+	=	X	ß
q_0	$q_1\|X\|R$	$q_0\|+\|R$	$q_3\|=\|R$		
q_1	$q_1\|1\|R$	$q_4\|+\|R$	$q_1\|=\|R$		$q_2\|1\|L$
q_2	$q_2\|1\|L$	$q_2\|+\|L$	$q_2\|=\|L$	$q_0\|1\|R$	
$*q_3$					
q_4	$q_1\|1\|R$				

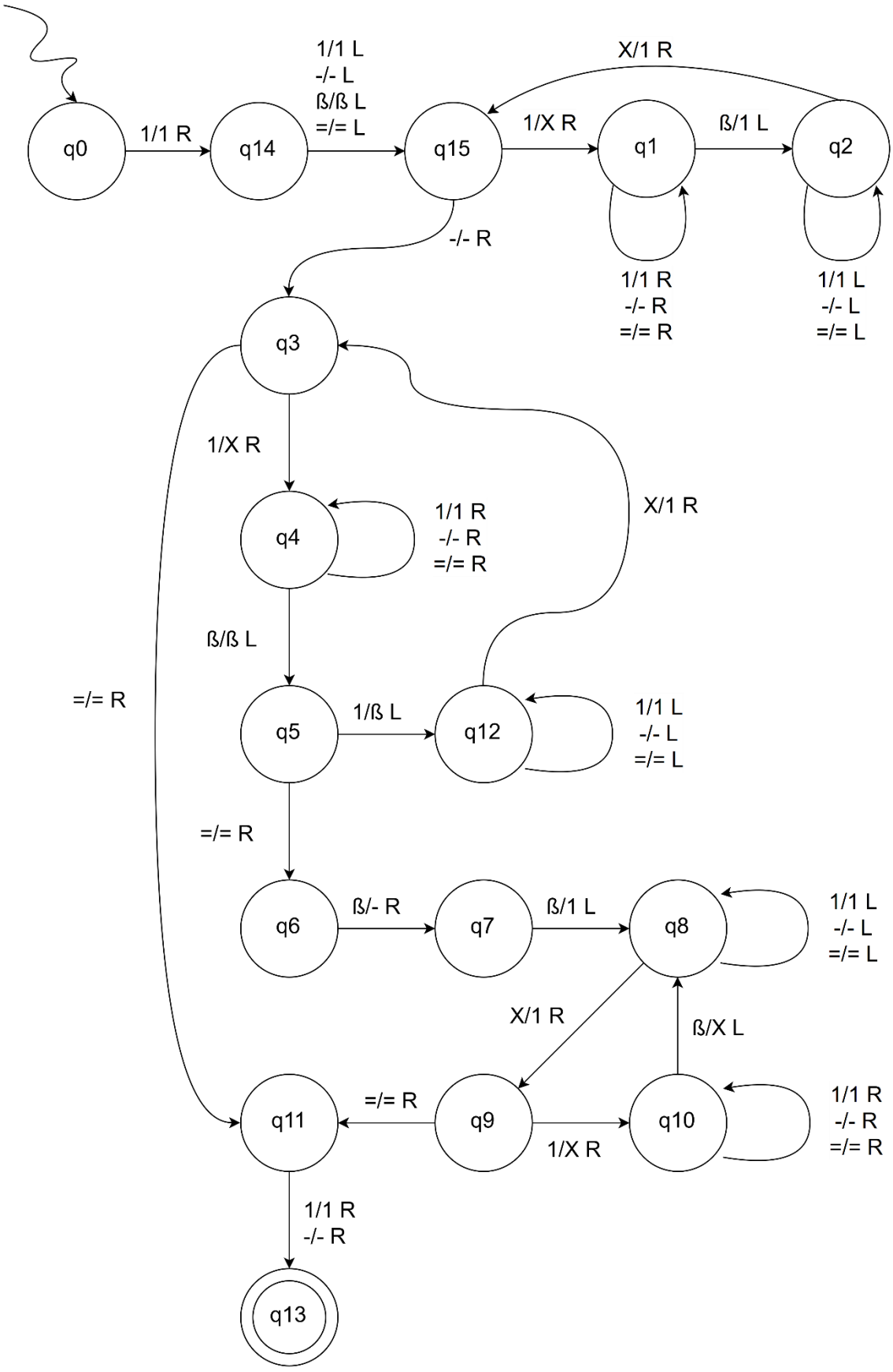


Restador

$M = (Q, \Sigma, \Gamma, \delta, q_0, ß, F)$

$Q = \{q_0, q_1, q_2, q_3, q_4, q_5, q_6, q_7, q_8, q_9, q_{10}, q_{11}, q_{12}, q_{13}, q_{14}, q_{15}\}$
$\Sigma = \{1, -, =\}$
$\Gamma = \{1, -, =, X, ß\}$
$F = q_{13}$

Estados	Símbolos				
	1	−	=	X	ß
q_0	$q_{14}\|1\|R$				
q_1	$q_1\|1\|R$	$q_1\|-\|R$	$q_1\|=\|R$		$q_2\|1\|L$
q_2	$q_2\|1\|R$	$q_2\|-\|R$	$q_2\|=\|R$	$q_0\|1\|R$	
q_3	$q_4\|X\|R$		$q_{11}\|=\|R$		
q_4	$q_4\|1\|R$	$q_4\|-\|R$	$q_4\|=\|R$		$q_5\|ß\|L$
q_5	$q_{12}\|ß\|L$		$q_6\|=\|R$		
q_6					$q_7\|-\|R$
q_7					$q_8\|1\|L$
q_8	$q_8\|1\|L$	$q_8\|-\|L$	$q_8\|=\|L$	$q_9\|1\|R$	
q_9	$q_{10}\|X\|R$		$q_{11}\|=\|R$		
q_{10}	$q_{10}\|1\|R$	$q_{10}\|-\|R$	$q_{10}\|=\|R$		$q_8\|X\|L$
q_{11}	$q_{13}\|1\|R$	$q_{13}\|-\|R$			
q_{12}	$q_{12}\|1\|L$	$q_{12}\|-\|L$	$q_{12}\|=\|L$	$q_3\|1\|R$	
$^*q_{13}$					
q_{14}	$q_{15}\|1\|R$	$q_{15}\|-\|R$	$q_{15}\|=\|R$		$q_{15}\|ß\|R$
q_{15}	$q_1\|X\|R$	$q_3\|-\|R$			

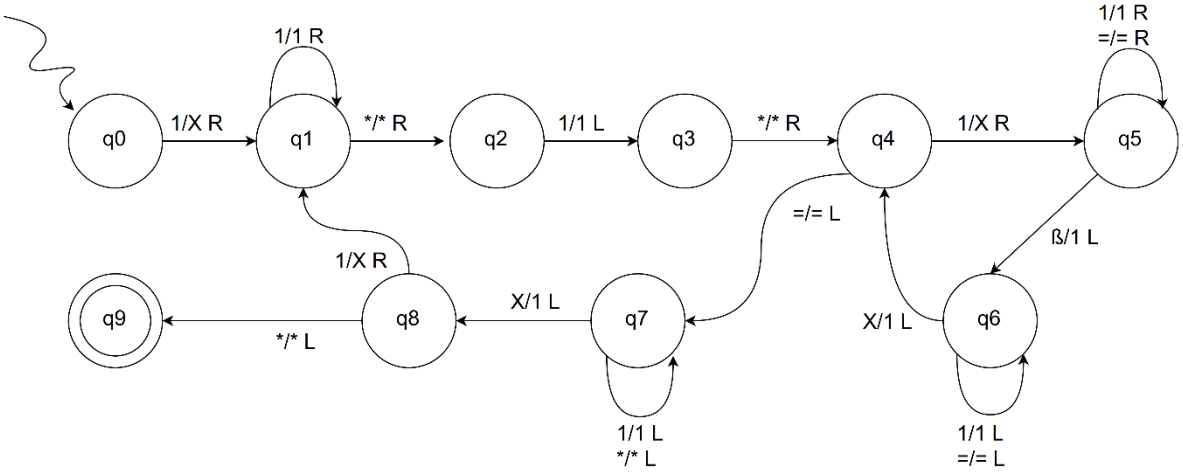

q0
1/1 R
q14
1/1 L
-/- L
ß/ß L
=/= L
q15
1/X R
q1
ß/1 L
q2
X/1 R
-/- R
1/1 R
-/- R
=/= R
1/1 L
-/- L
=/= L
q3
1/X R
q4
1/1 R
-/- R
=/= R
X/1 R
ß/ß L
=/= R
q5
1/ß L
q12
1/1 L
-/- L
=/= L
=/= R
q6
ß/- R
q7
ß/1 L
q8
1/1 L
-/- L
=/= L
X/1 R
ß/X L
q11
=/= R
q9
1/X R
q10
1/1 R
-/- R
=/= R
1/1 R
-/- R
q13

Multiplicador

$M = (Q, \Sigma, \Gamma, \delta, q_0, ß, F)$

$Q = \{q_0, q_1, q_2, q_3, q_4, q_5, q_6, q_7, q_8, q_9\}$
$\Sigma = \{1, *, =\}$
$\Gamma = \{1, *, =, X, ß\}$
$F = q_9$

Estados	Símbolos				
	1	*	=	X	ß
q_0	$q_1\|X\|R$				
q_1	$q_1\|1\|R$	$q_2\|*\|R$			
q_2	$q_3\|1\|L$				
q_3		$q_4\|*\|R$			
q_4	$q_5\|X\|R$		$q_7\|=\|L$		
q_5	$q_5\|1\|R$		$q_5\|=\|R$		$q_6\|1\|L$
q_6	$q_6\|1\|L$		$q_6\|=\|L$	$q_4\|1\|L$	
q_7	$q_7\|1\|L$	$q_7\|*\|L$		$q_8\|1\|L$	
q_8	$q_1\|X\|R$	$q_8\|*\|L$			
$*q_9$					

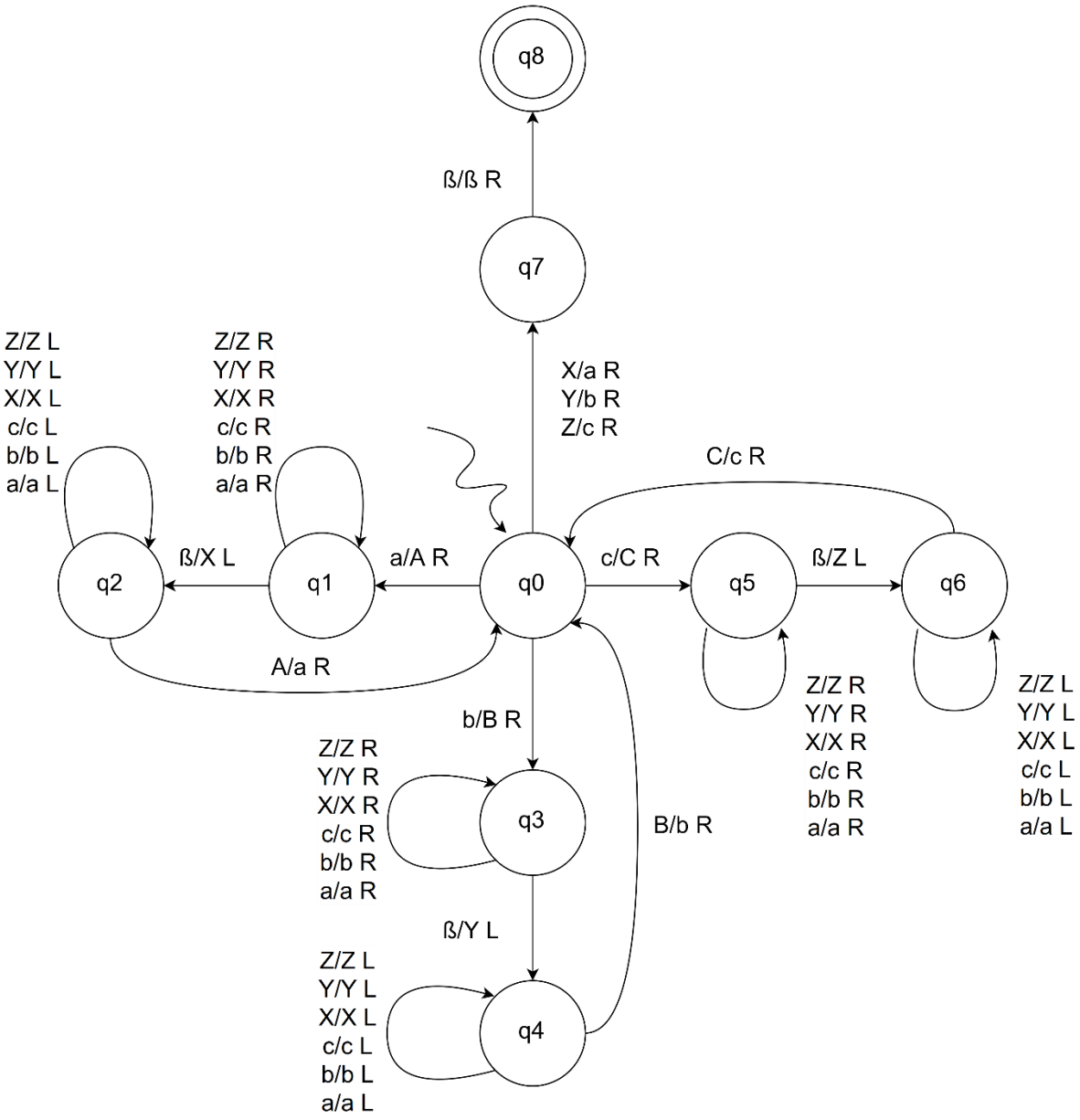


Duplicador

$M = (Q, \Sigma, \Gamma, \delta, q_0, ß, F)$

$Q = \{q_0, q_1, q_2, q_3, q_4, q_5, q_6, q_7, q_8, q_9\}$
$\Sigma = \{a, b, c\}$
$\Gamma = \{a, b, c, A, B, C, X, Y, Z, ß\}$
$F = q_8$

Estados	Símbolos									
	a	b	c	A	B	C	X	Y	Z	ß
q_0	$q_1\|A\|R$	$q_3\|B\|R$	$q_5\|C\|R$				$q_7\|a\|R$	$q_7\|b\|R$	$q_7\|c\|R$	
q_1	$q_1\|a\|R$	$q_1\|b\|R$	$q_1\|c\|R$				$q_1\|X\|R$	$q_1\|Y\|R$	$q_1\|Z\|R$	$q_2\|X\|L$
q_2	$q_2\|a\|L$	$q_2\|b\|L$	$q_2\|c\|L$	$q_0\|a\|R$			$q_2\|X\|L$	$q_2\|Y\|L$	$q_2\|Z\|L$	
q_3	$q_3\|a\|R$	$q_3\|b\|R$	$q_3\|c\|R$				$q_3\|X\|R$	$q_3\|Y\|R$	$q_3\|Z\|R$	$q_4\|X\|L$
q_4	$q_4\|a\|L$	$q_4\|b\|L$	$q_4\|c\|L$		$q_0\|b\|R$		$q_4\|X\|L$	$q_4\|Y\|L$	$q_4\|Z\|L$	
q_5	$q_5\|a\|R$	$q_5\|b\|R$	$q_5\|c\|R$				$q_5\|X\|R$	$q_5\|Y\|R$	$q_5\|Z\|R$	$q_6\|X\|L$
q_6	$q_6\|a\|L$	$q_6\|b\|L$	$q_6\|c\|L$			$q_0\|c\|R$	$q_6\|X\|L$	$q_6\|Y\|L$	$q_6\|Z\|L$	
q_7										$q_8\|ß\|L$
$*q_8$										

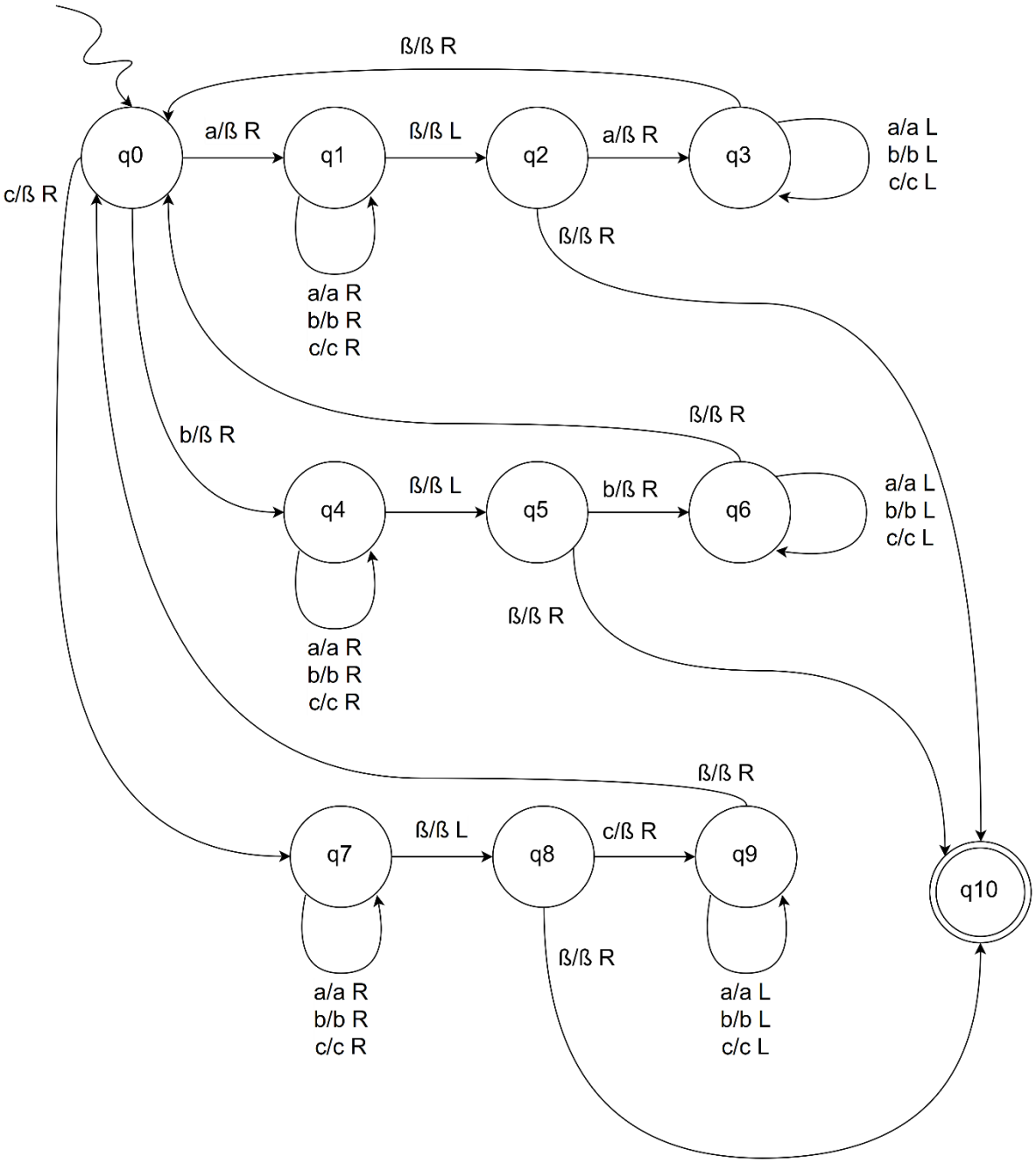

q8
ß/ß R
q7
X/a R
Y/b R
Z/c R
Z/Z L
Y/Y L
X/X L
c/c L
b/b L
a/a L
Z/Z R
Y/Y R
X/X R
c/c R
b/b R
a/a R
C/c R
q2
ß/X L
q1
a/A R
q0
c/C R
q5
ß/Z L
q6
A/a R
Z/Z R
Y/Y R
X/X R
c/c R
b/b R
a/a R
Z/Z L
Y/Y L
X/X L
c/c L
b/b L
a/a L
b/B R
Z/Z R
Y/Y R
X/X R
c/c R
b/b R
a/a R
q3
B/b R
ß/Y L
Z/Z L
Y/Y L
X/X L
c/c L
b/b L
a/a L
q4

Palíndromos

$M = (Q, \Sigma, \Gamma, \delta, q_0, ß, F)$

$Q = \{q_0, q_1, q_2, q_3, q_4, q_5, q_6, q_7, q_8, q_9, q_{10}\}$
$\Sigma = \{a, b, c\}$
$\Gamma = \{a, b, c, ß\}$
$F = q_{13}$

Estados	Símbolos			
	a	b	c	ß
q_0	$q_1\|ß\|R$	$q_4\|ß\|R$	$q_7\|ß\|R$	
q_1	$q_1\|a\|R$	$q_1\|b\|R$	$q_1\|c\|R$	$q_2\|ß\|L$
q_2	$q_3\|ß\|R$			$q_{10}\|ß\|R$
q_3	$q_3\|a\|L$	$q_3\|b\|L$	$q_3\|c\|L$	$q_0\|ß\|R$
q_4	$q_4\|a\|R$	$q_4\|b\|R$	$q_4\|c\|R$	$q_5\|ß\|L$
q_5		$q_6\|ß\|R$		$q_{10}\|ß\|R$
q_6	$q_6\|a\|L$	$q_6\|b\|L$	$q_6\|c\|L$	$q_0\|ß\|R$
q_7	$q_7\|a\|R$	$q_7\|b\|R$	$q_7\|c\|R$	$q_8\|ß\|L$
q_8			$q_9\|ß\|R$	$q_{10}\|ß\|R$
q_9	$q_9\|a\|L$	$q_9\|b\|L$	$q_9\|c\|L$	
$^*q_{10}$				


q0
q1
q2
q3
q4
q5
q6
q7
q8
q9
q10
ß/ß R
a/ß R
ß/ß L
a/ß R
a/a L
b/b L
c/c L
c/ß R
ß/ß R
a/a R
b/b R
c/c R
ß/ß R
b/ß R
ß/ß L
b/ß R
a/a L
b/b L
c/c L
ß/ß R
a/a R
b/b R
c/c R
ß/ß R
ß/ß L
c/ß R
ß/ß R
a/a R
b/b R
c/c R
a/a L
b/b L
c/c L