

FUNDAMENTOS TEÓRICOS DA COMPUTAÇÃO

--- MÁQUINAS DE TURING ---

Exemplo (1)

$\omega \# \omega$

$$L_1 = \{\varphi = \omega \# \omega : \omega \in \{0,1\}^*\}$$



Use o arsenal que você tem e seja criativo!

$\omega \# \omega$

M_1 = Sobre a cadeia de entrada φ :

1. Faça uma varredura na fita para assegurar que φ possui somente um “#”; caso contrário **rejeite**;
2. Faça um zigue-zague na fita para as posições correspondentes em cada lado do símbolo # para verificar se essas posições contêm o mesmo símbolo.

Se **não** tiver o mesmo símbolo, **rejeite**.

Marque os símbolos conforme eles são verificados para acompanhar a correspondência entre os símbolos.

3. Quando todos os símbolos à esquerda do # tiverem sido marcados, verifique se há símbolos restantes à direita do #. Se algum símbolo permanecer, **rejeite**; caso contrário, **aceite**.

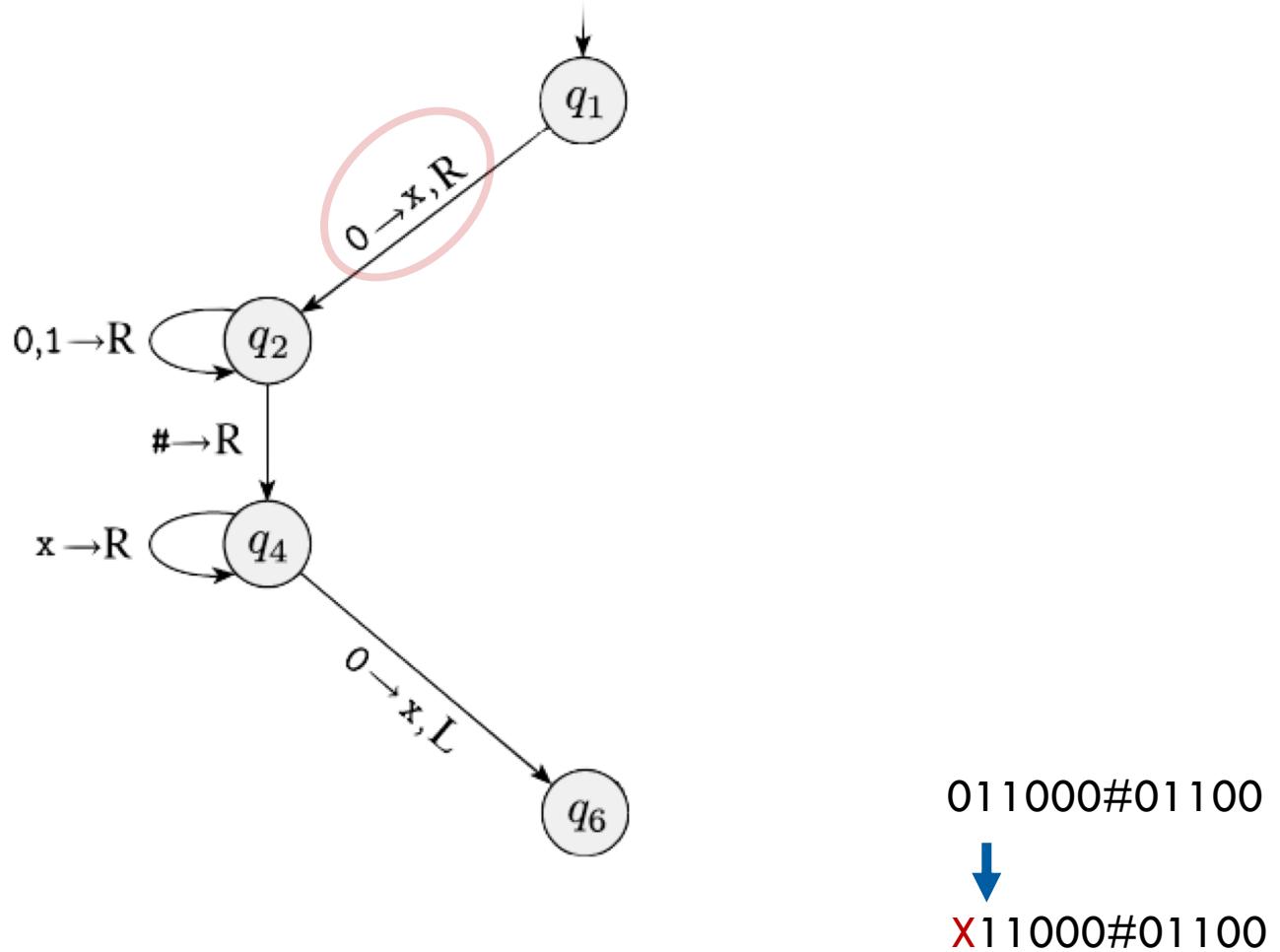
$\omega \# \omega$

The diagram illustrates six snapshots of a Turing machine tape during the computation of $\omega \# \omega$. The tape contains the string $011000\#011000\dots$. In each snapshot, the head position is indicated by a bracketed arrow pointing to the current symbol under computation.

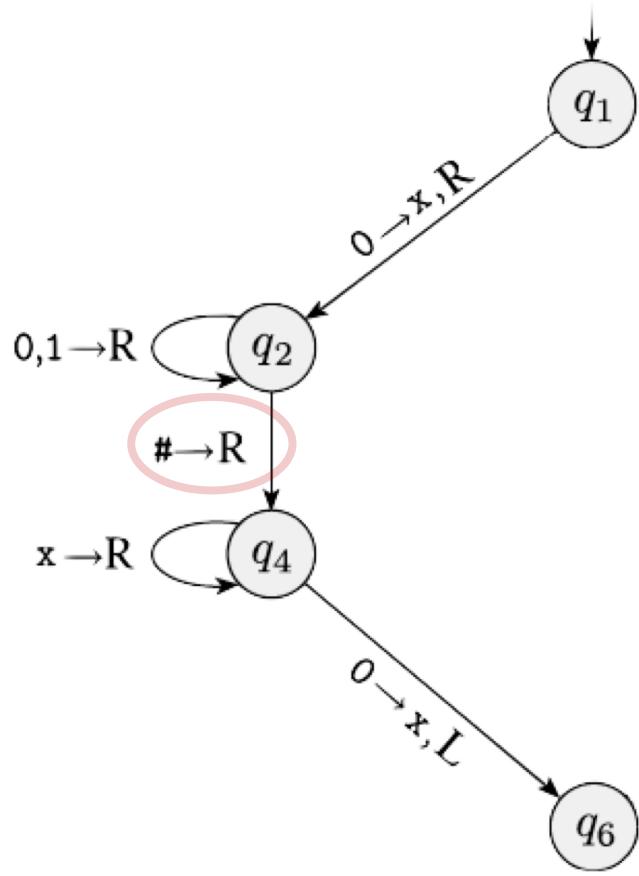
- Snapshot 1: The head is at the first '0'. The tape shows $011000\#011000\dots$.
- Snapshot 2: The head has moved to the second '0'. The tape shows $x11000\#011000\dots$.
- Snapshot 3: The head has moved to the third '0'. The tape shows $x11000\#\underline{x}11000\dots$.
- Snapshot 4: The head has moved to the fourth '0'. The tape shows $x11000\#x11000\dots$.
- Snapshot 5: The head has moved to the fifth '0'. The tape shows $x\underline{x}1000\#x11000\dots$.
- Snapshot 6: The head has moved to the sixth '0'. The tape shows $x\underline{x}x\underline{x}\#x\underline{x}x\underline{x}x\dots$. Below this tape, the word "accept" is written.

Vários instantâneos não consecutivos da fita para a computação da entrada $011000\#011000$

$\omega \# \omega$

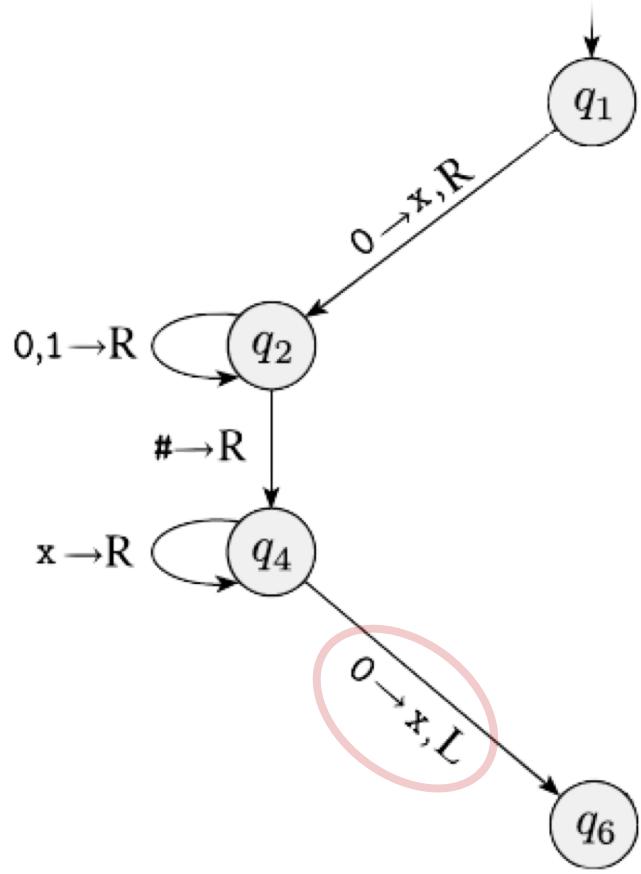


$\omega \# \omega$



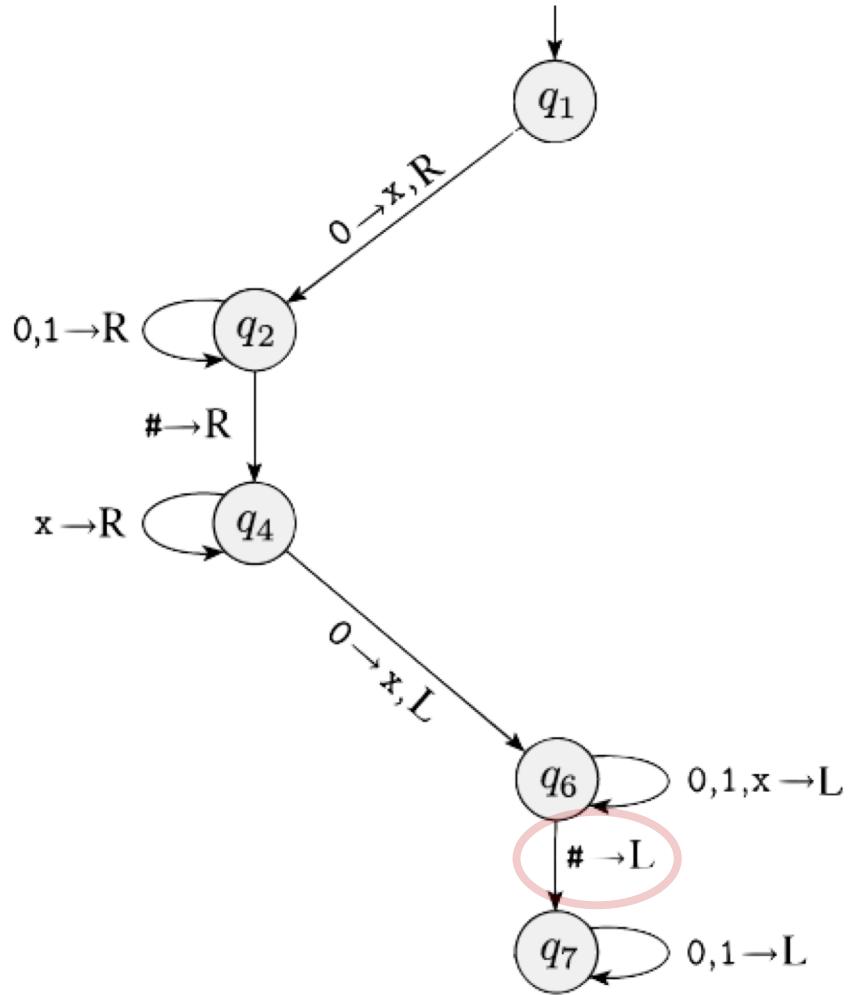
011000#01100
↓
X11000#01100

$\omega \# \omega$



011000#01100
↓
X11000#X1100

$\omega \# \omega$

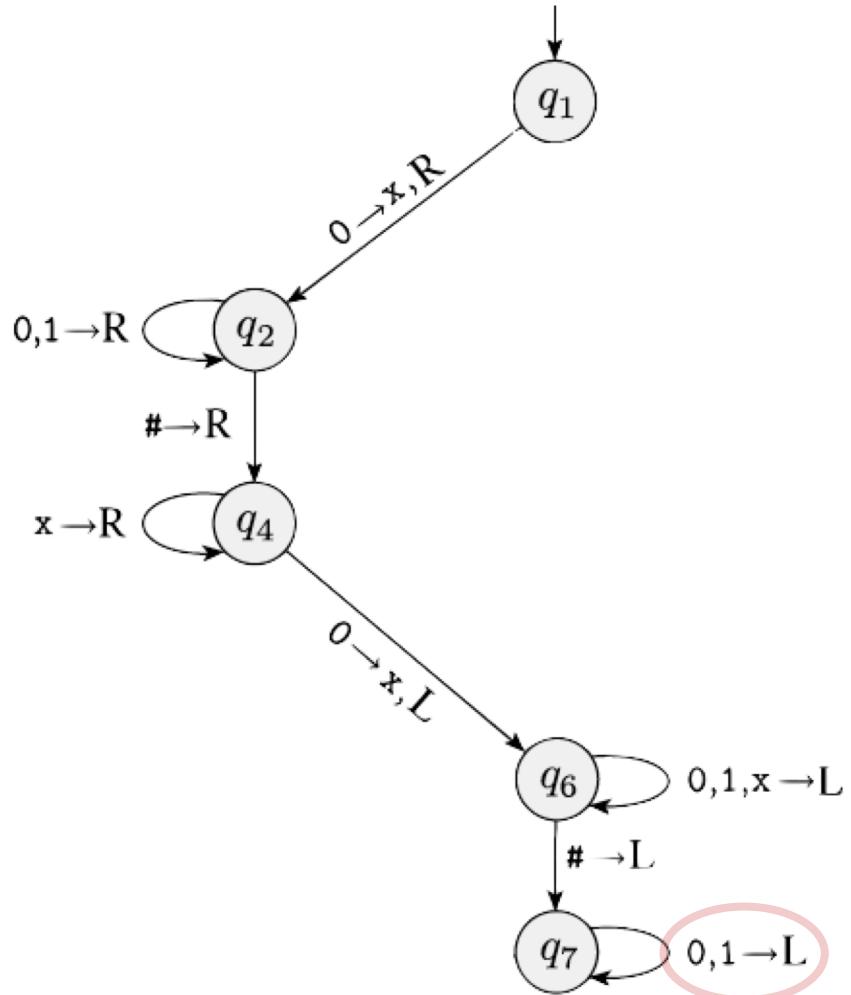


011000#01100



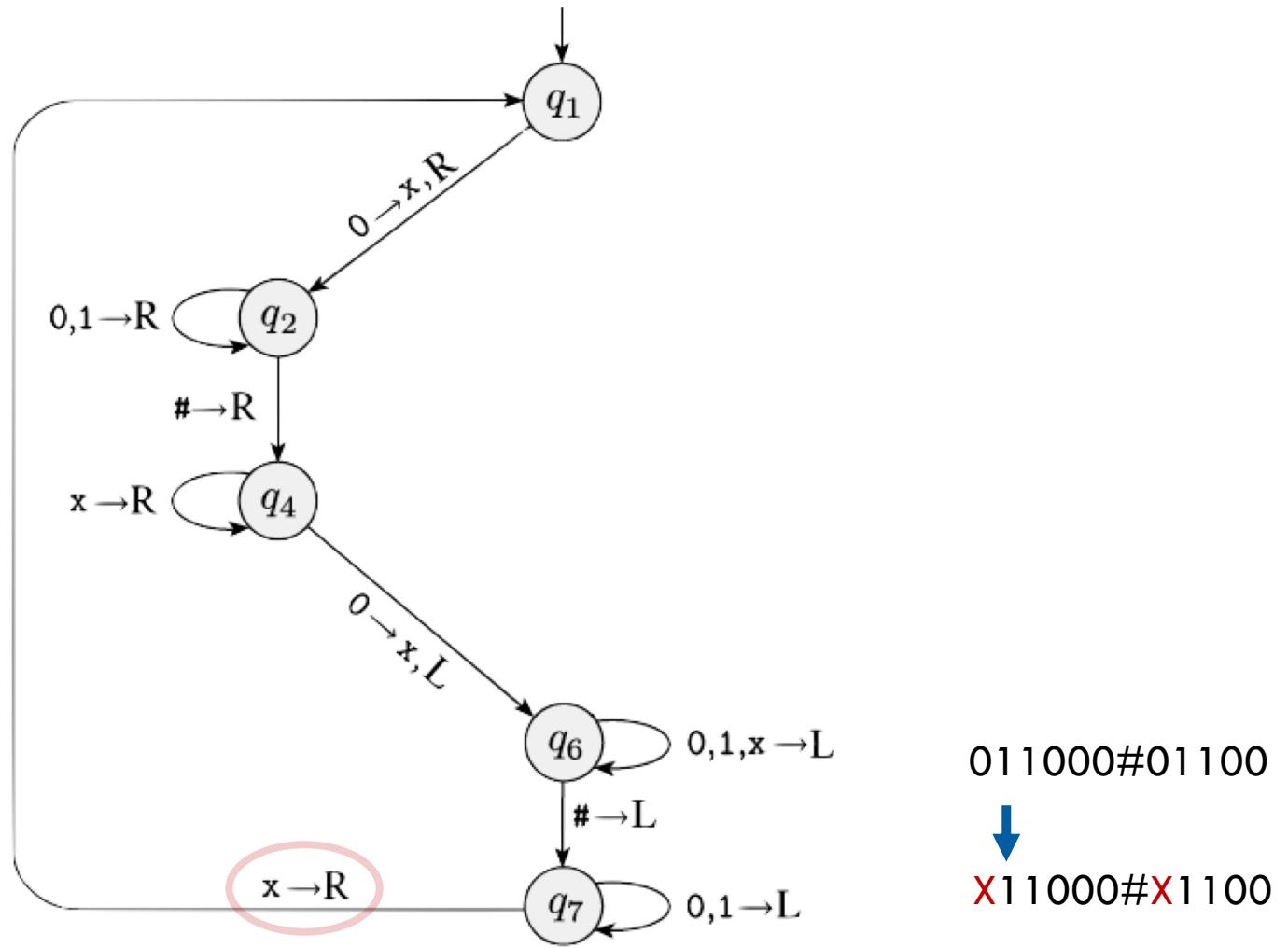
X11000#X1100

$\omega \# \omega$

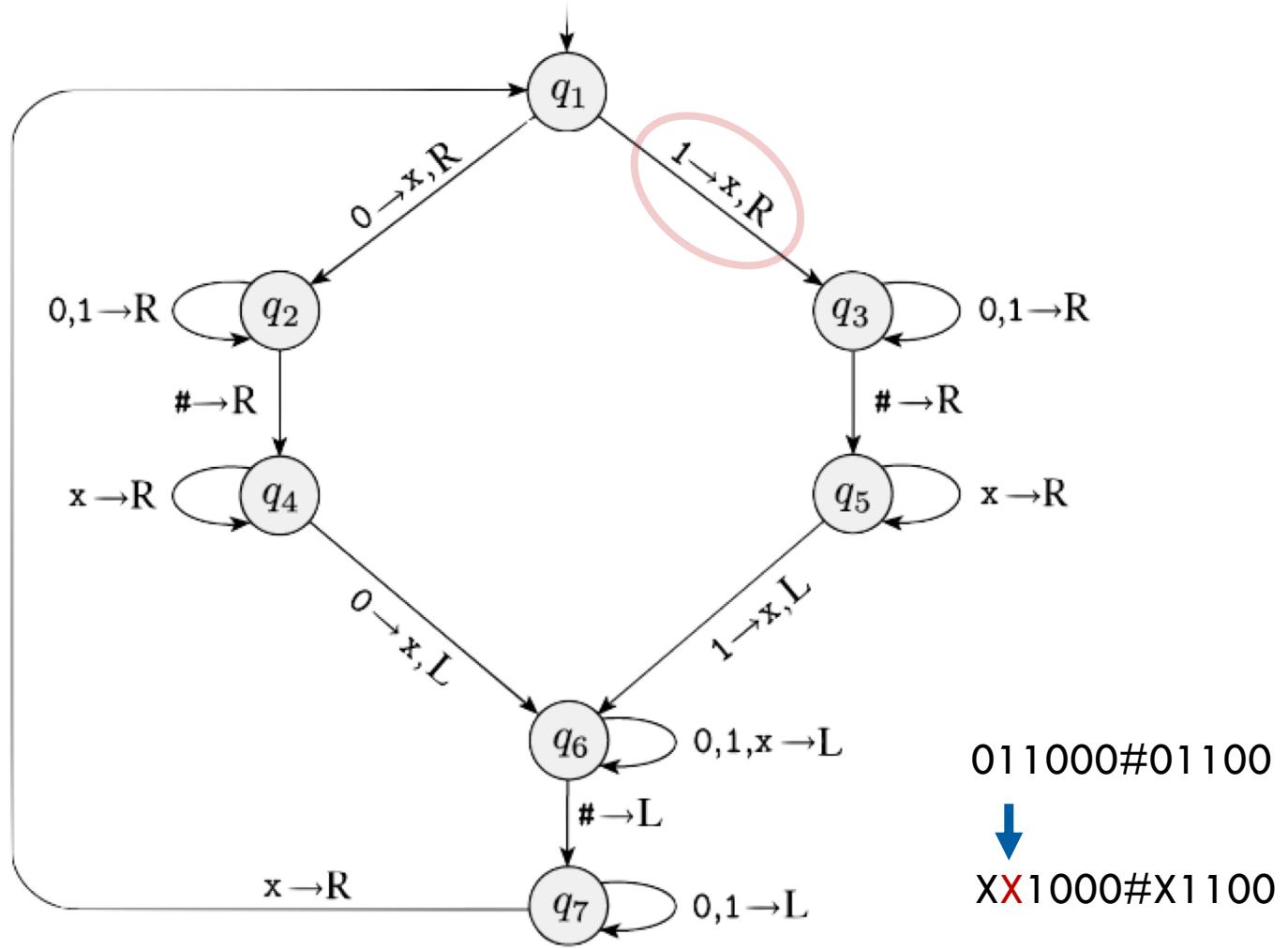


011000#01100
↓
X11000#X1100

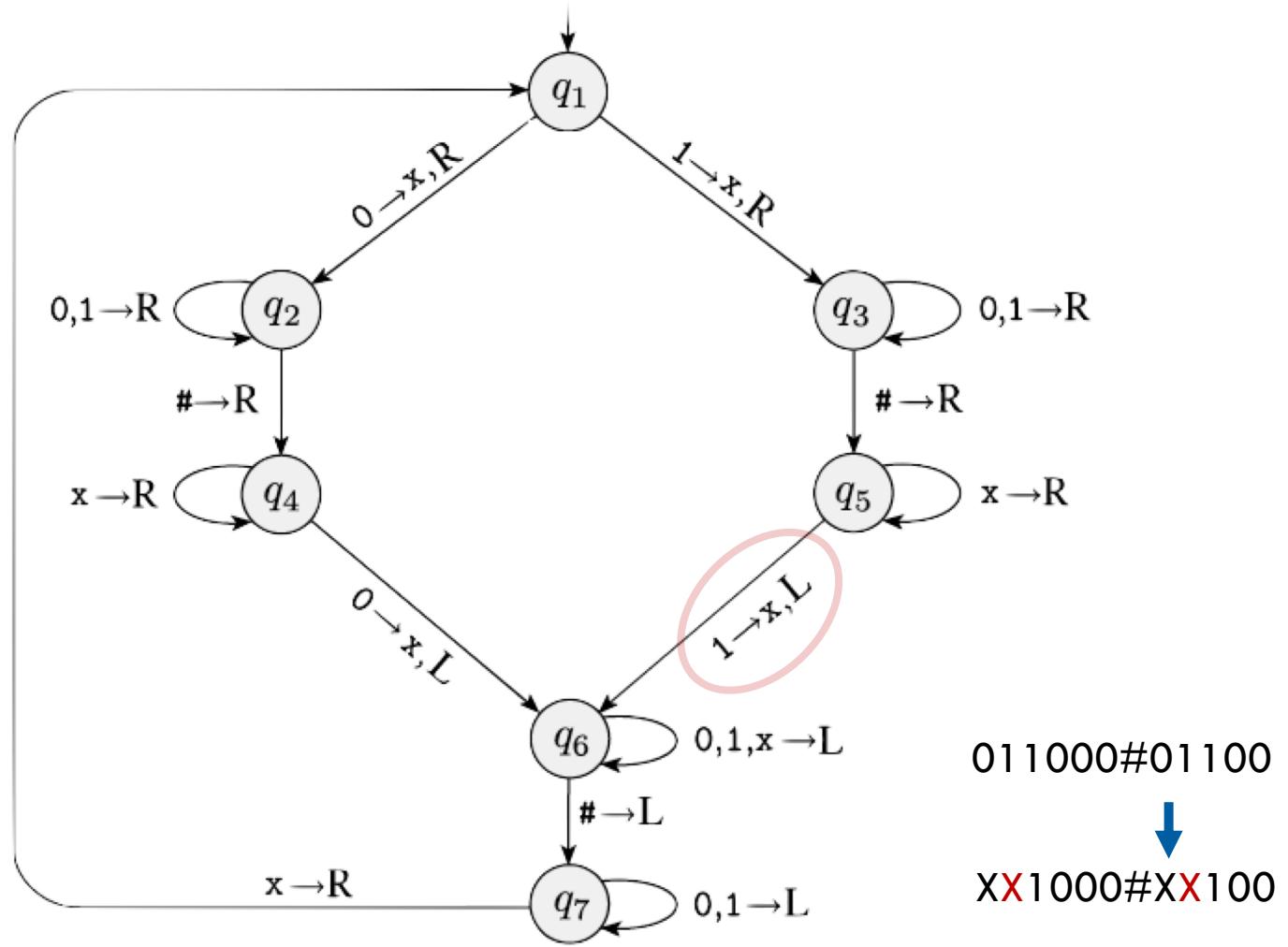
$\omega \# \omega$



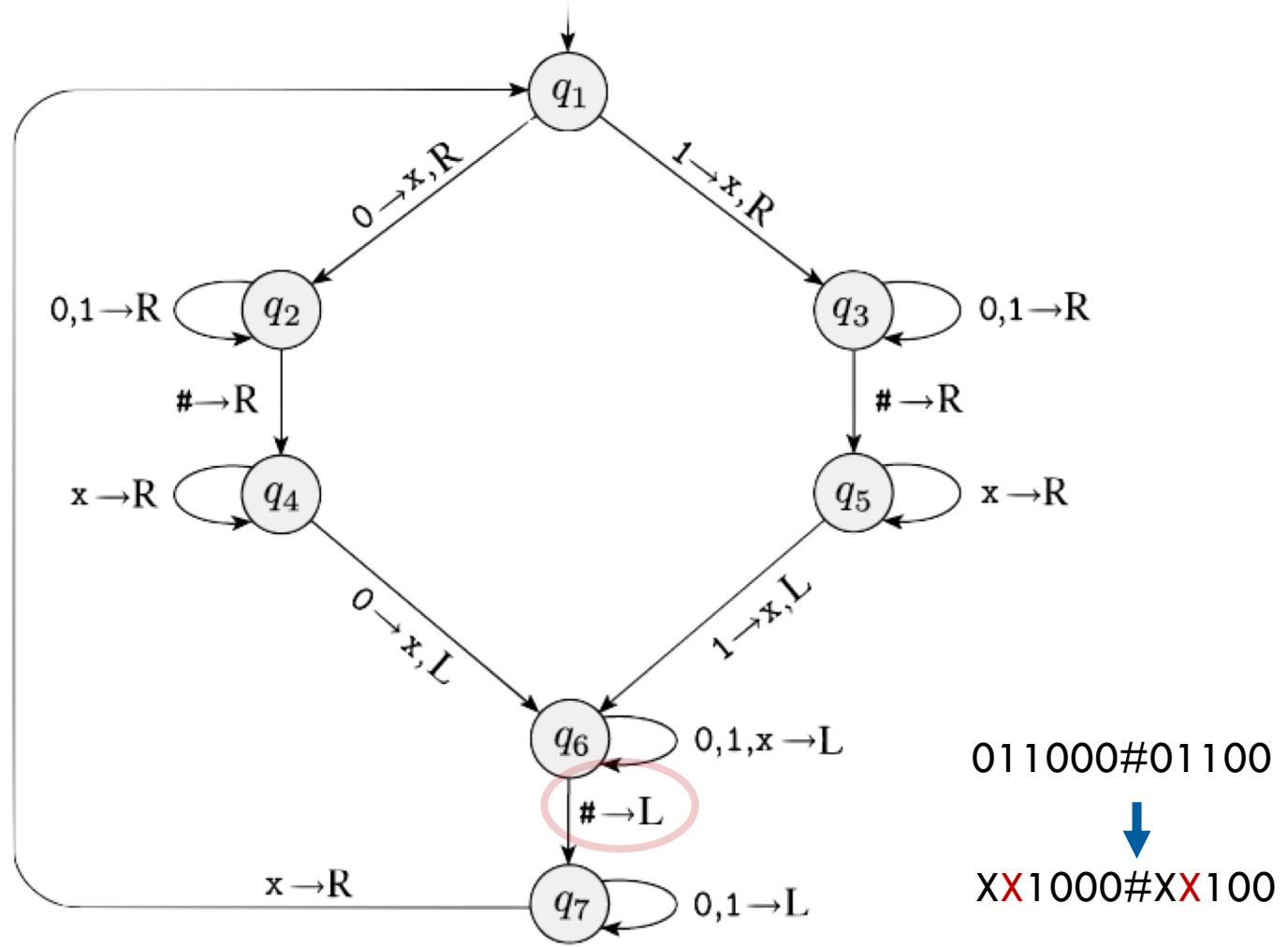
$\omega \# \omega$



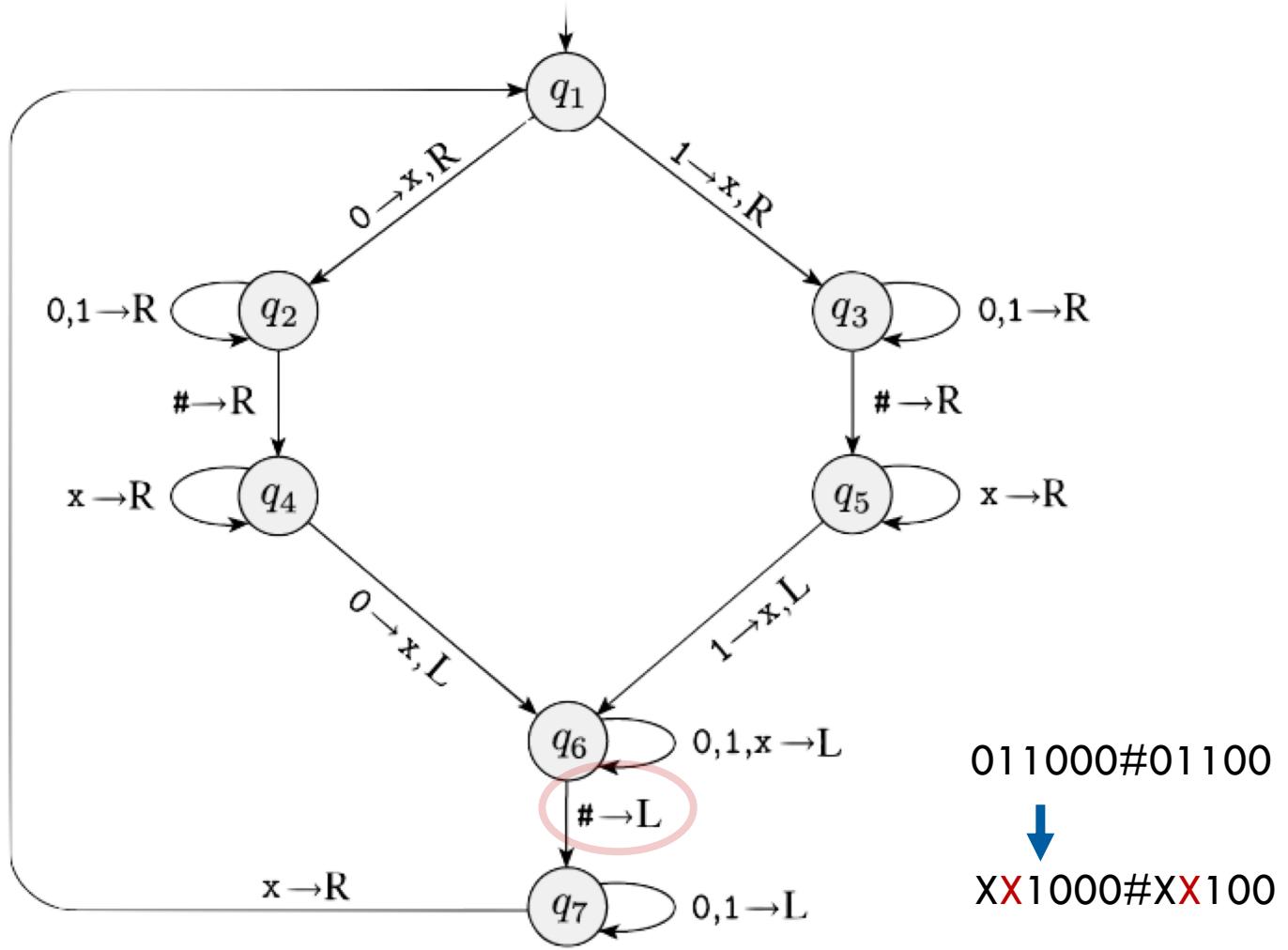
$\omega \# \omega$



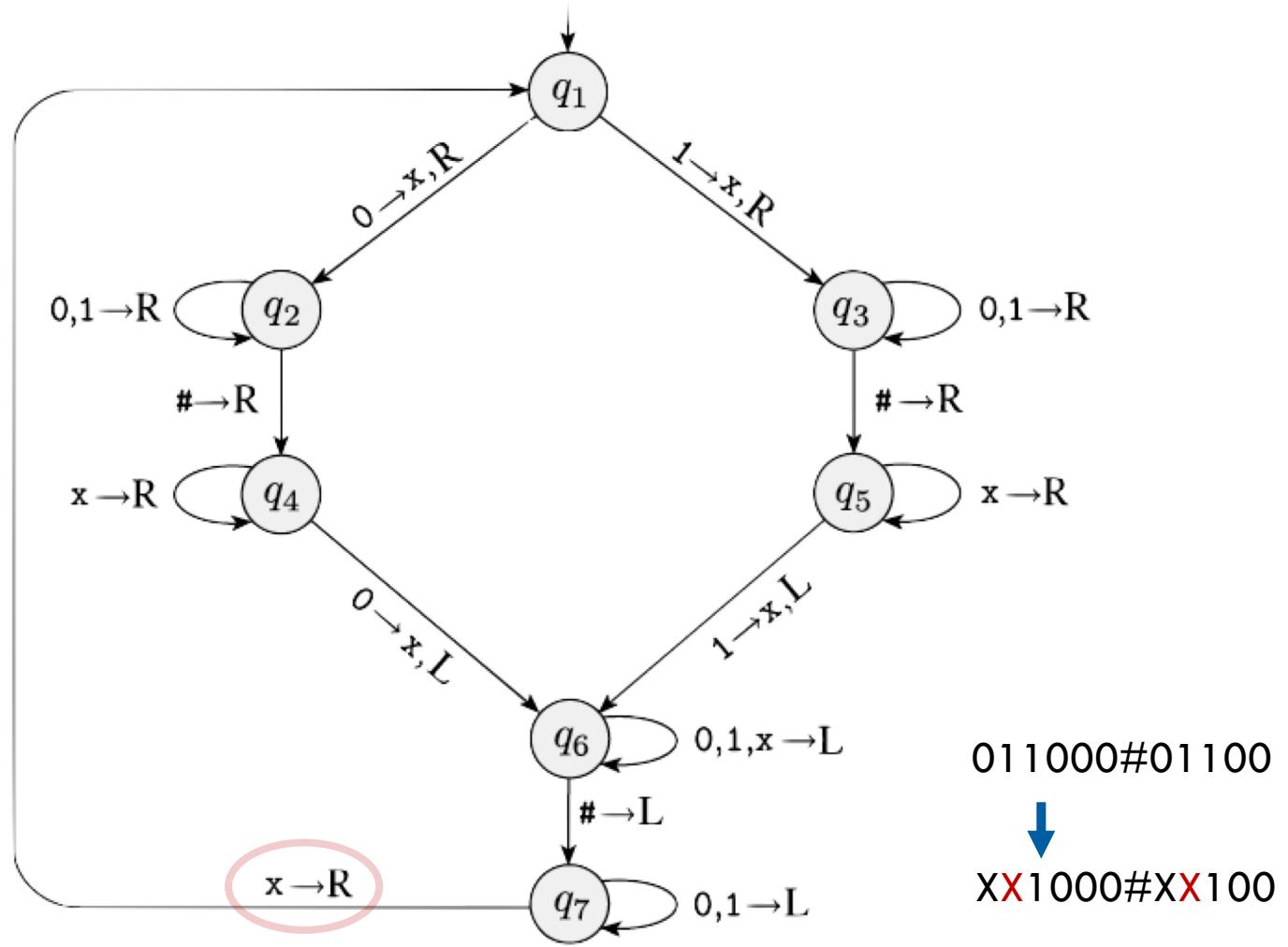
$\omega \# \omega$



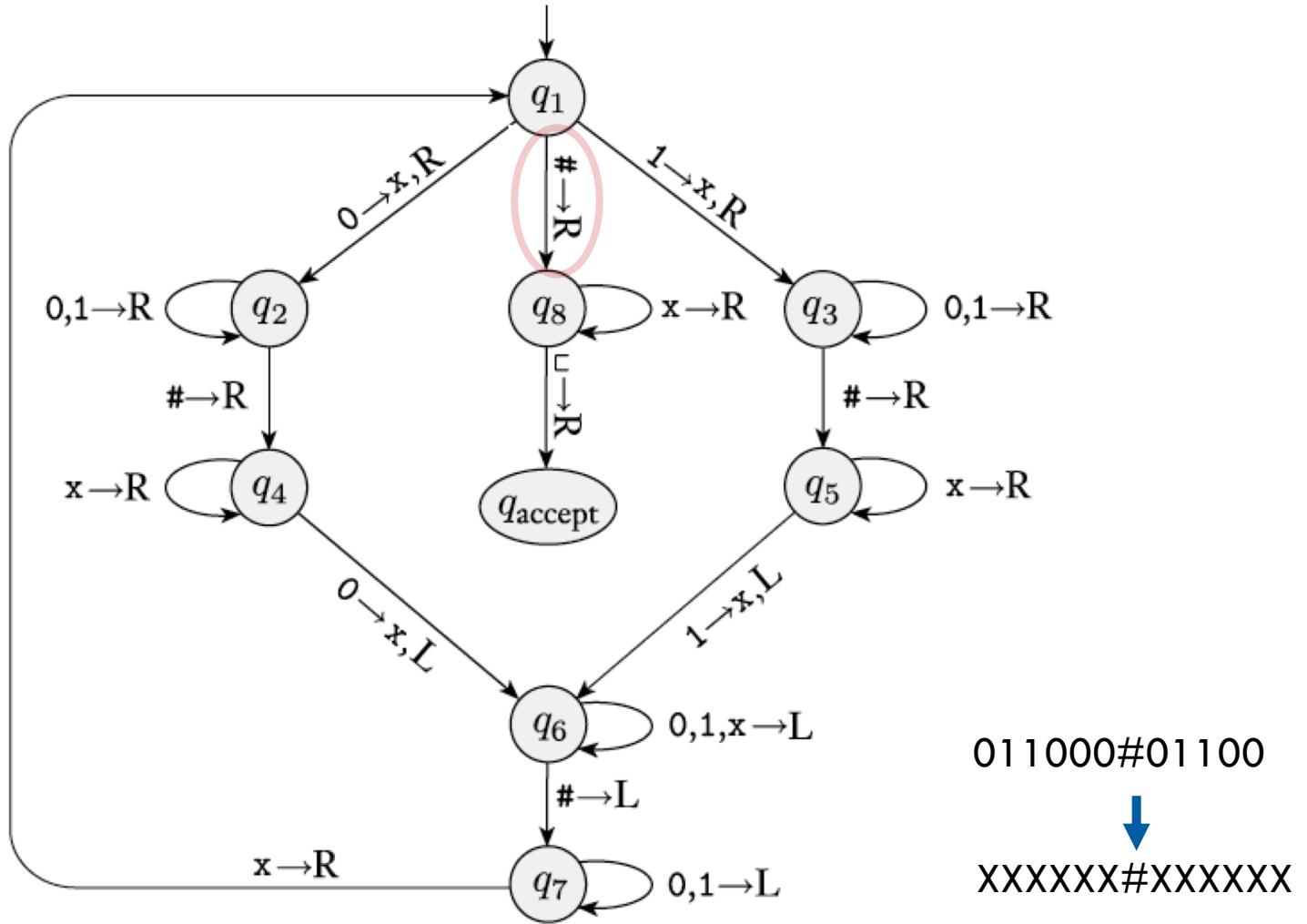
$\omega \# \omega$



$\omega \# \omega$

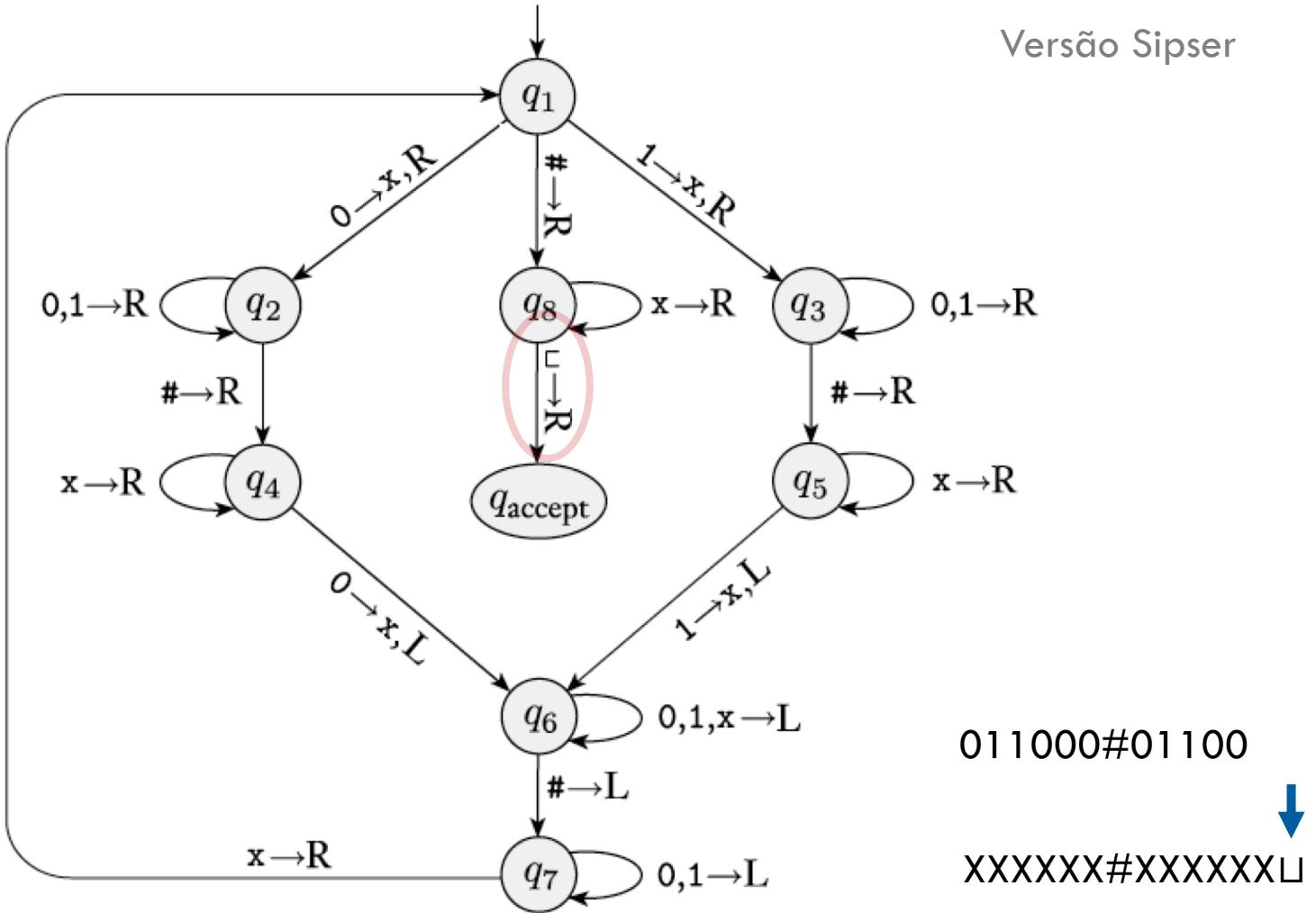


$\omega \# \omega$

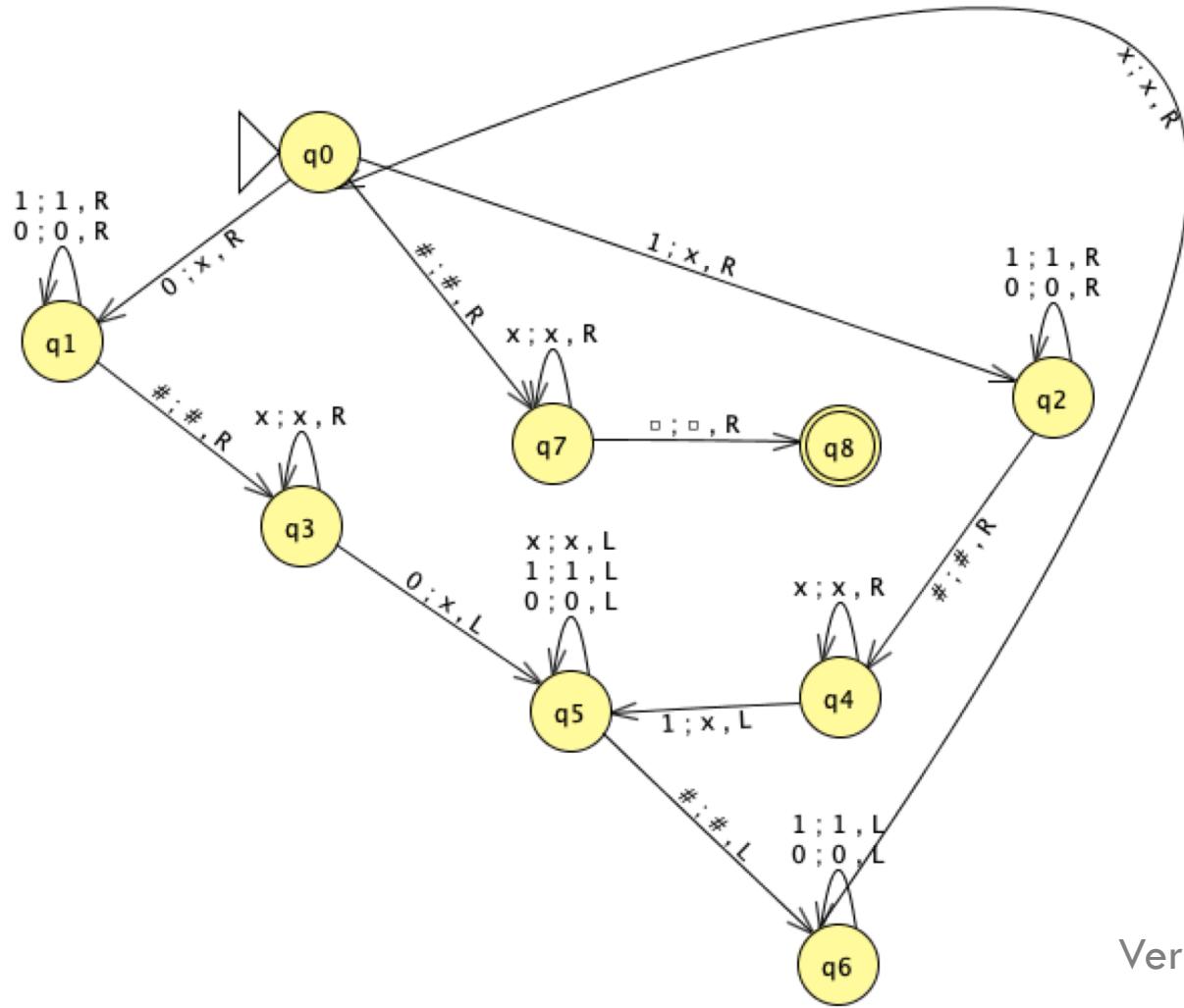


$\omega \# \omega$

Versão Sipser



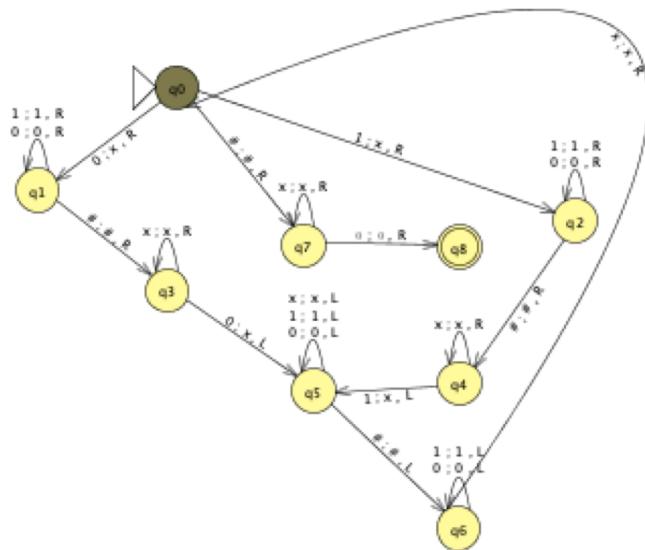
$\omega \# \omega$

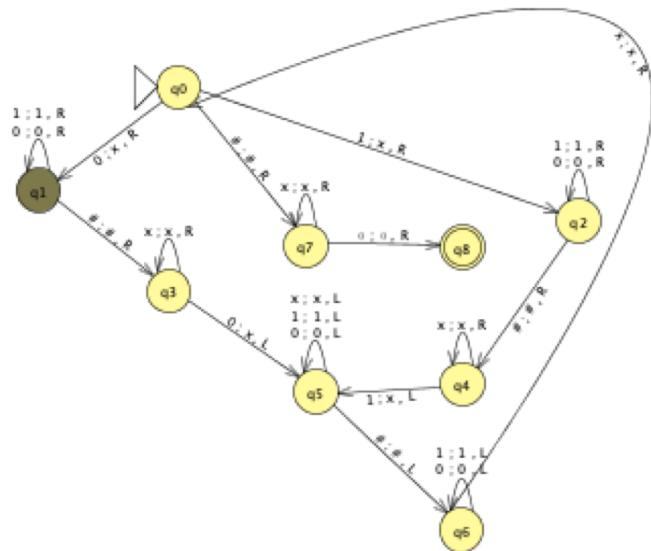




Simulando aceite

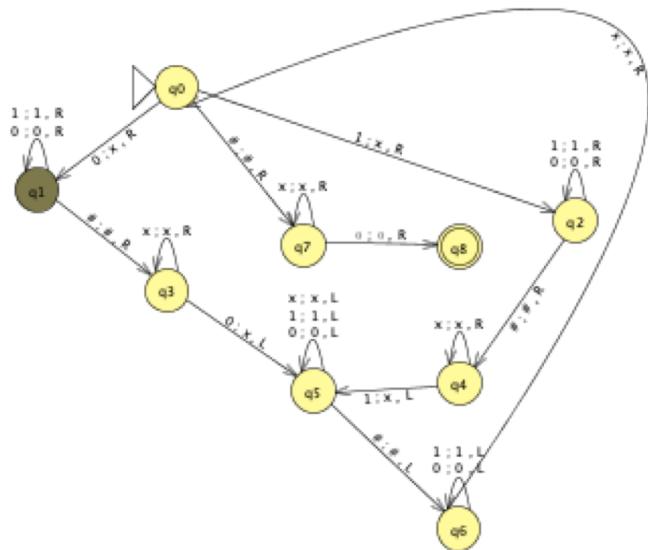
$\omega = 01\#01$





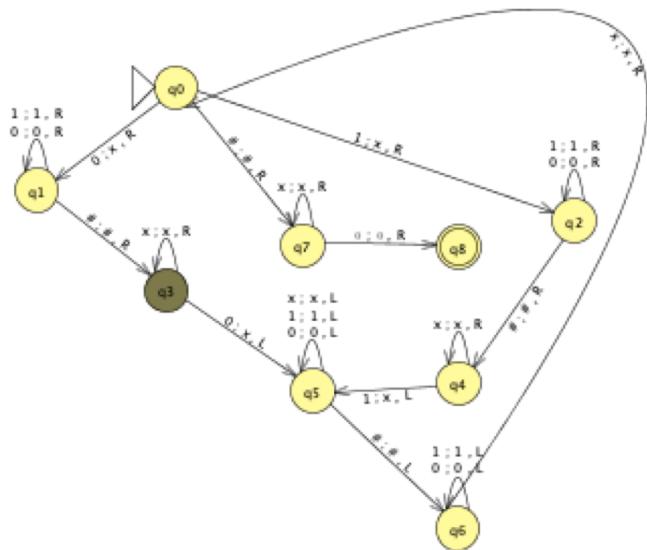
q_1

xxxxxxxxx1#01xxxxxx



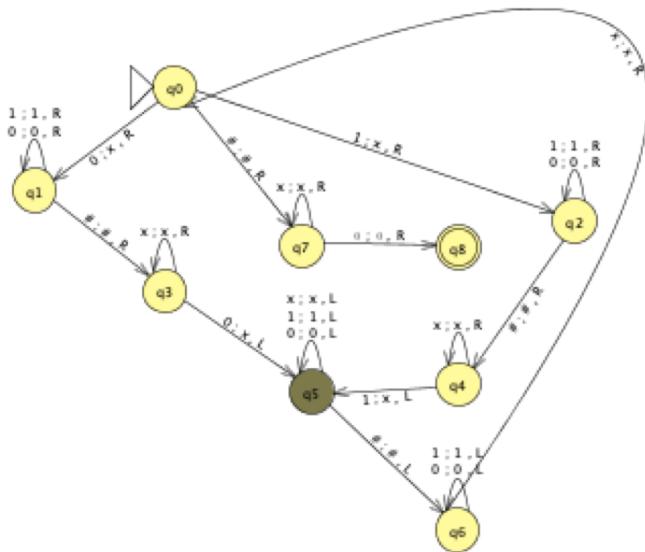
q_1

{xxxxxxxxx1#01xxxxxxxx}



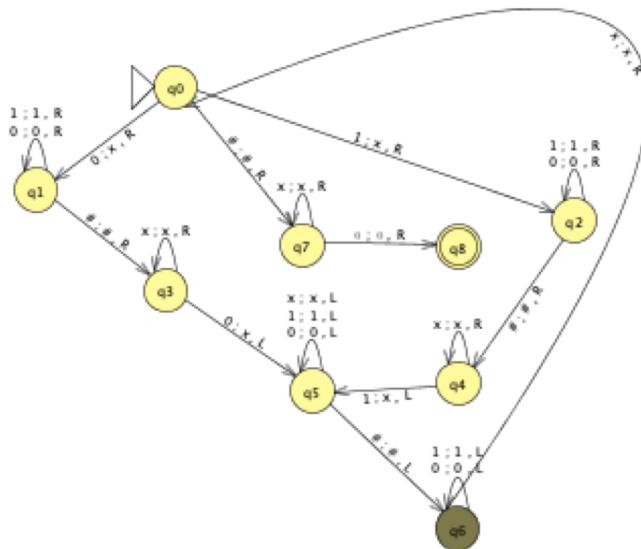
q_3

{oooooooooooo1#01oooooooooooo}



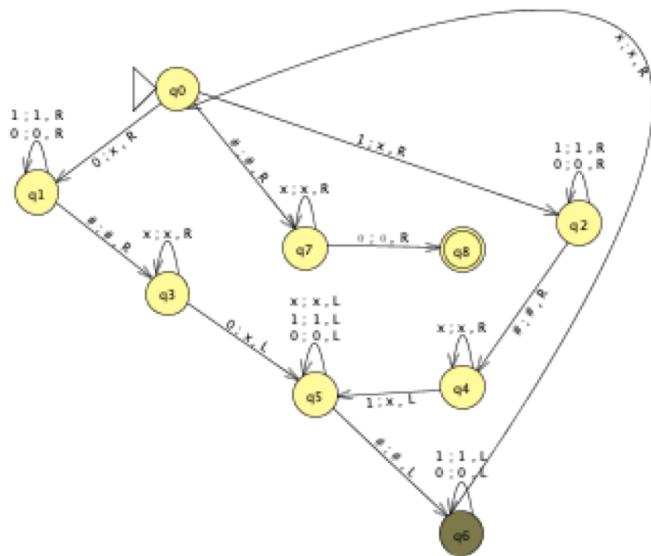
q_5

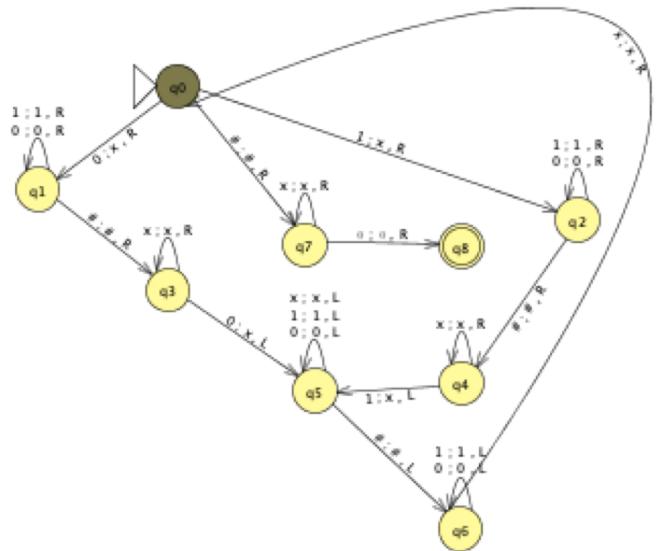
oooooooooooox1#x1oooooooooooo



q6

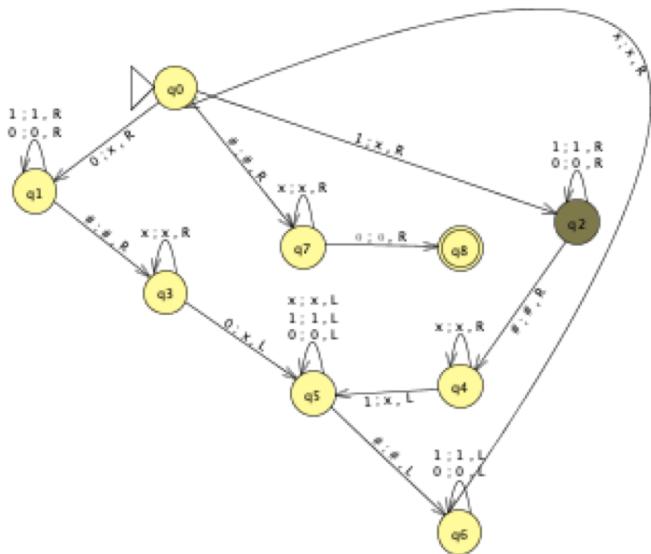
x1#x1



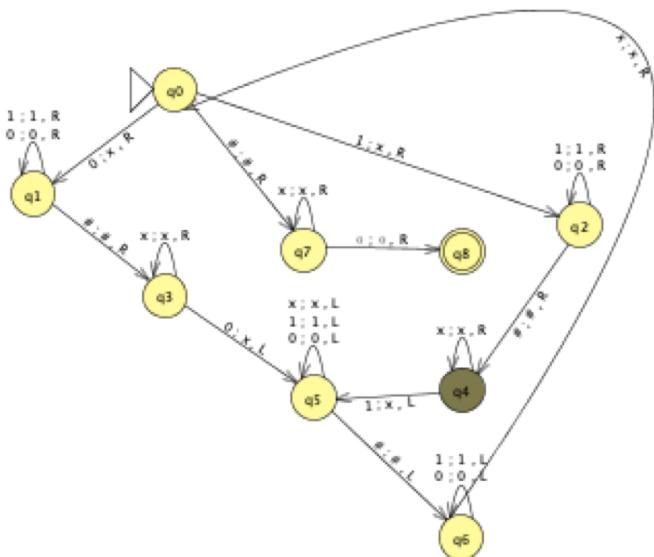


q0

x1#x1

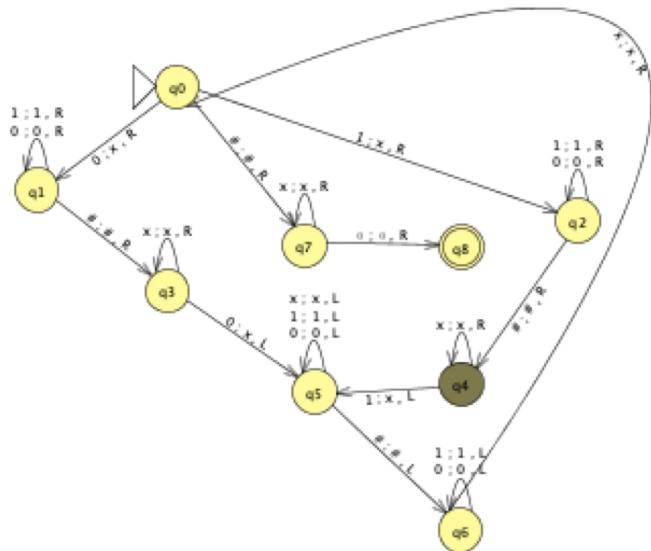


q2
xx#x1



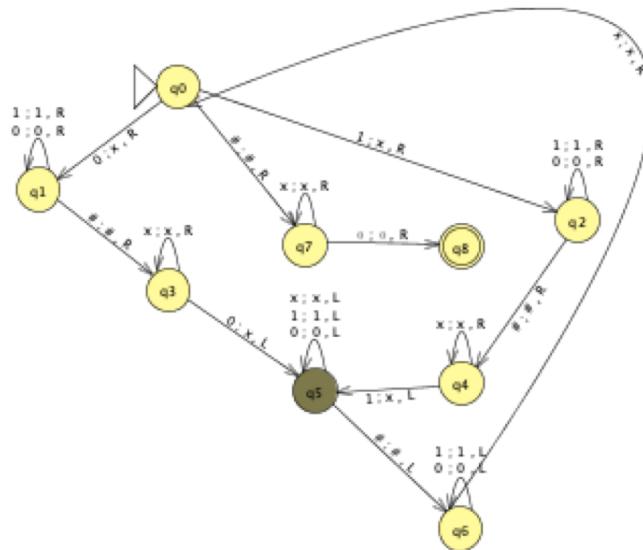
q_4

{xxxxxxxxxx#x1xxxxxxxxxxxx}



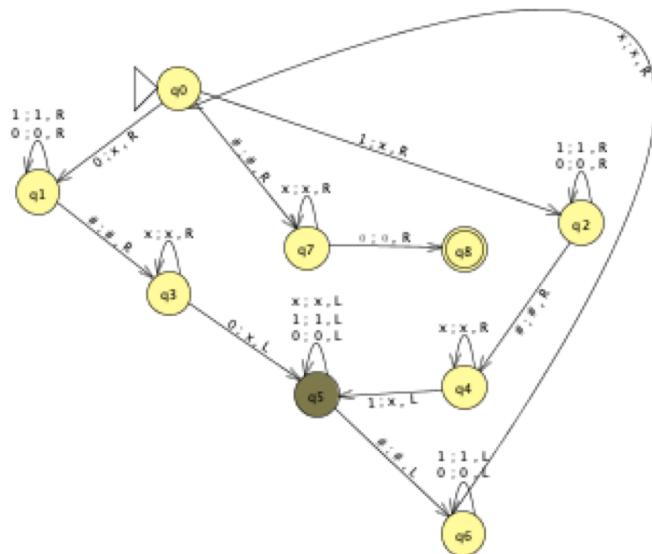
q_4

XXXXXXXXX#x1XXXXXXXXXX



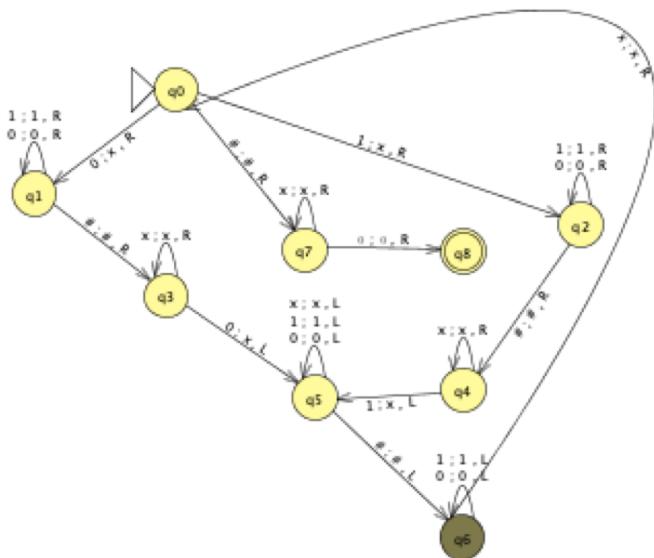
q5

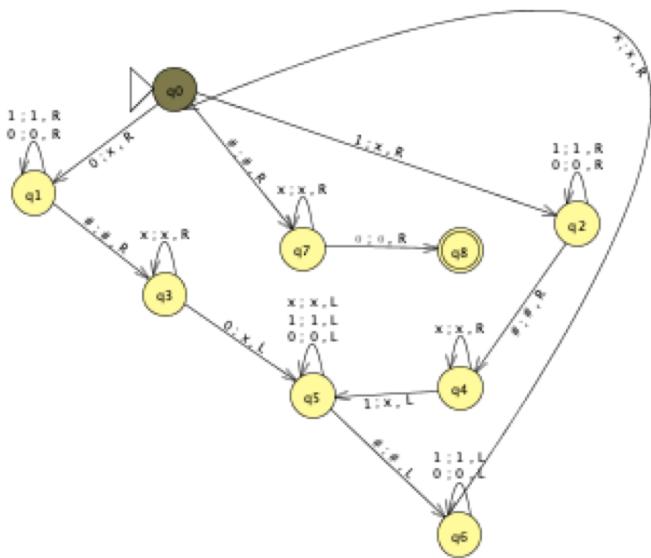
XXXXXXXXXX#XXXX

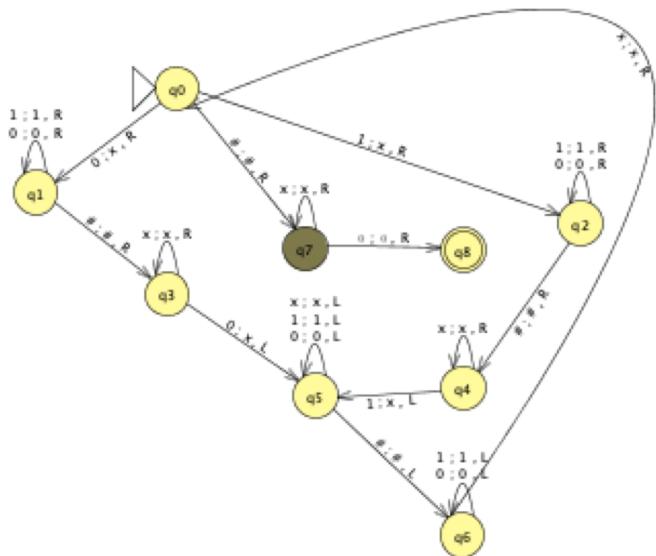


q5

XXXXXXXXXX#XXXX

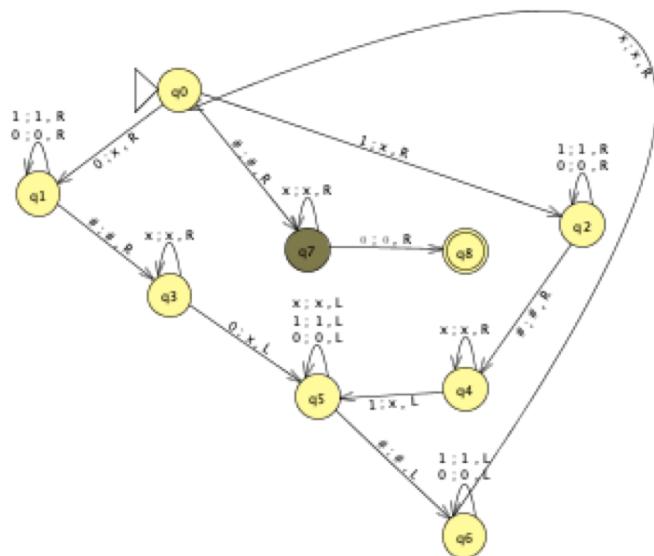






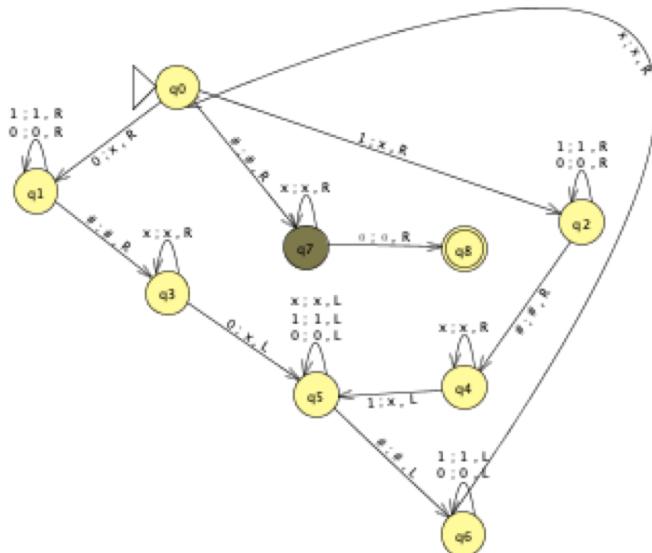
q_7

XXXXXXXXXX#
XXXXXXXXXXXXX



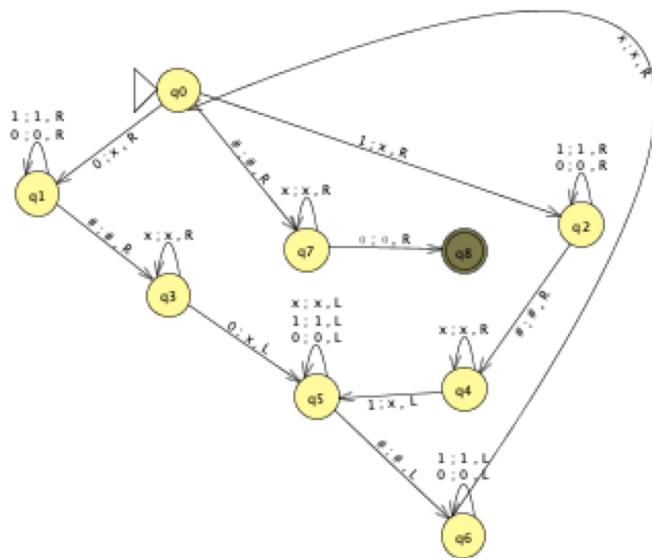
q_7

{oooooooooooo#xx#xxoooooooooooo}



q_7

□□□□□XX#XX□□□□□□□□□

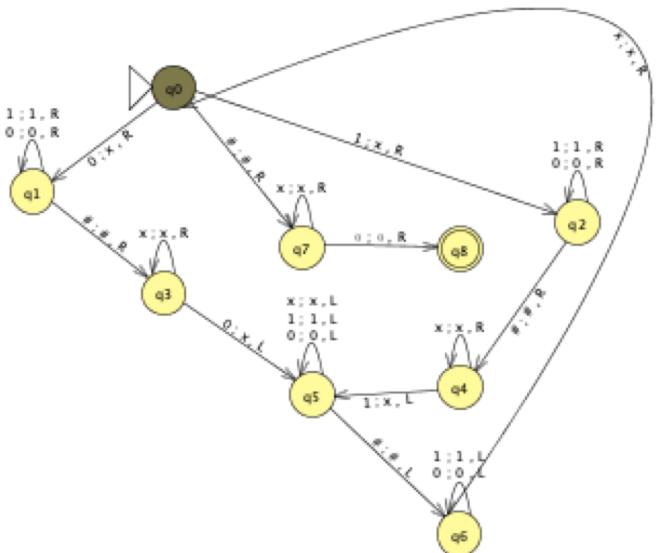


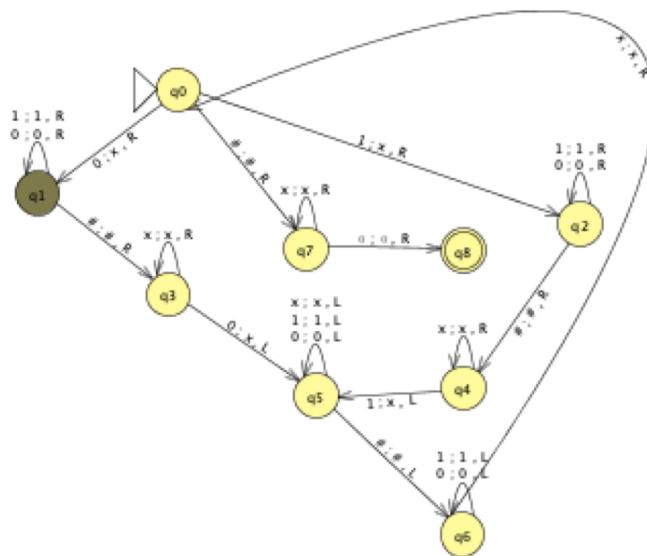
(q8)

{XXXXXX#XXXXXXXXXXX}

Simulando rejeição

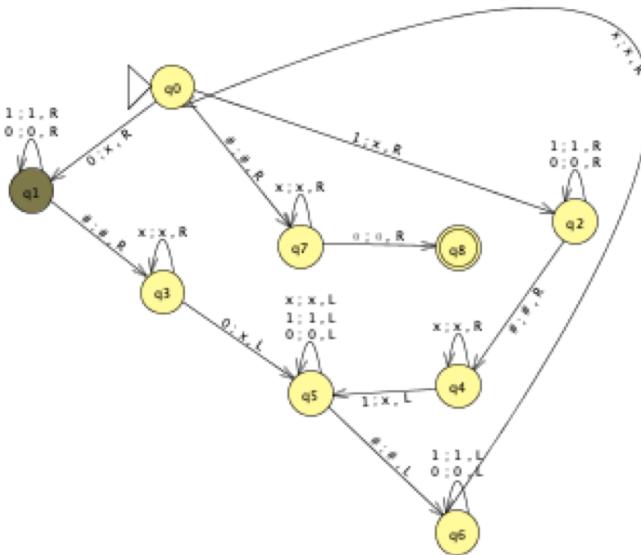
$\omega = 01\#00$





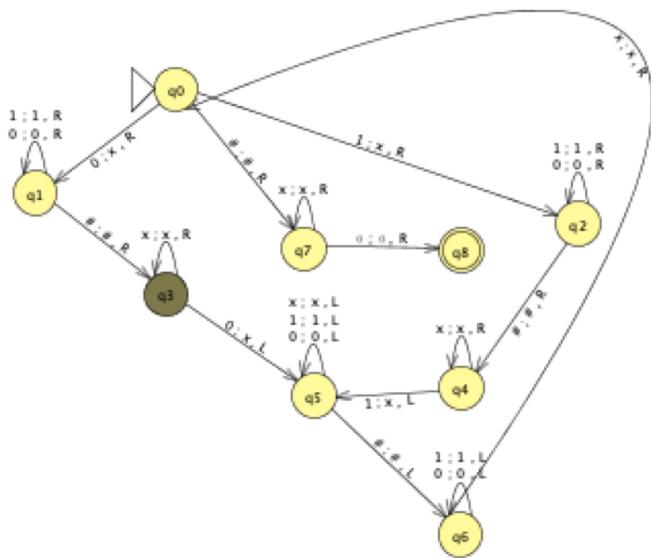
q_1

xxxxxxxxx1#00xxxxxx



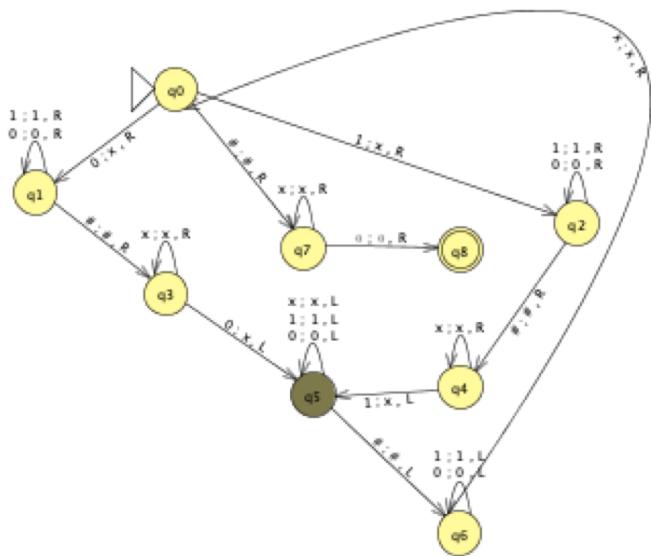
q_1

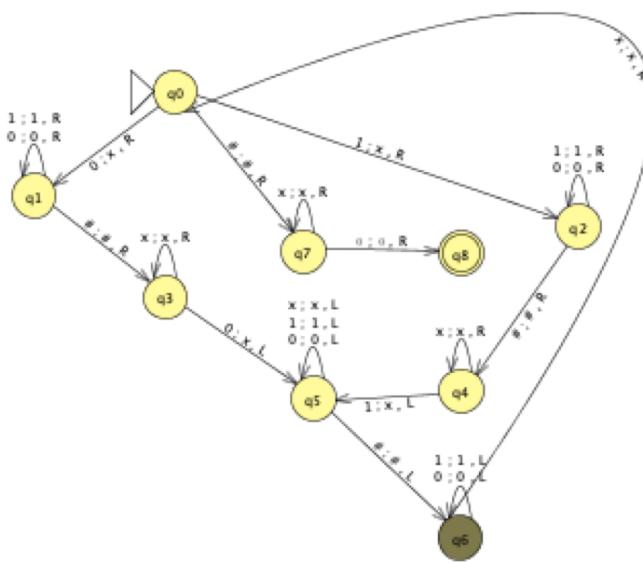
{xxxxxxxxx1#00xxxxxxxx}



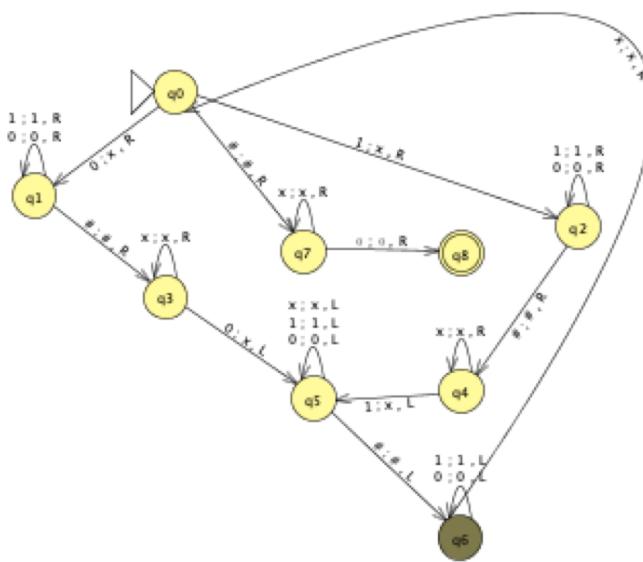
q3

x1#00

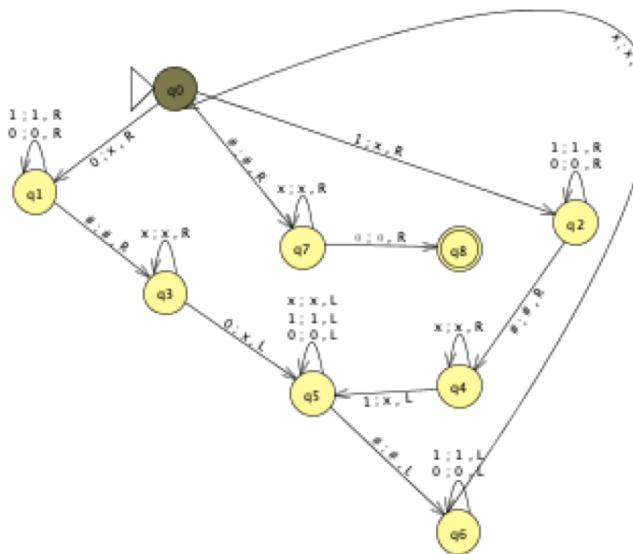




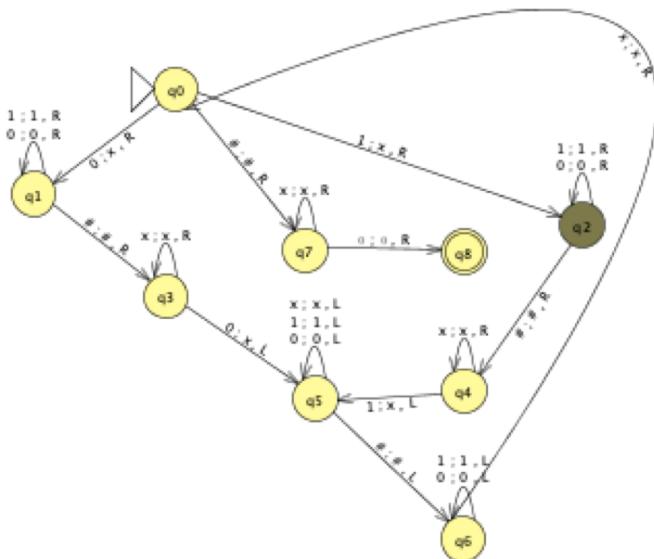
q_6
x1#x0



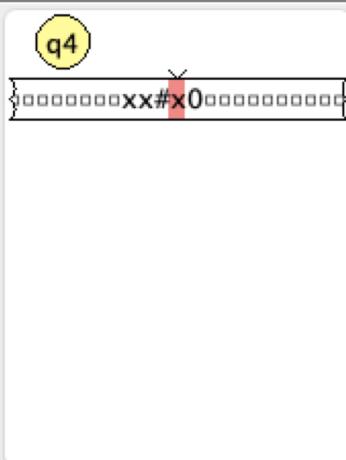
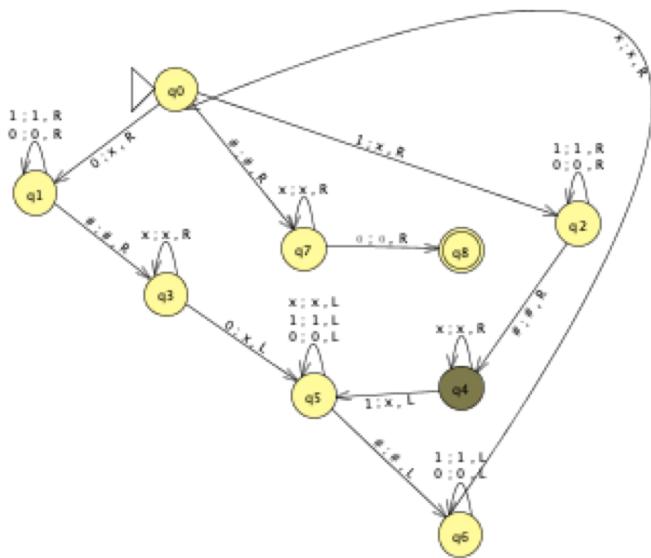
q_6
x1#x0

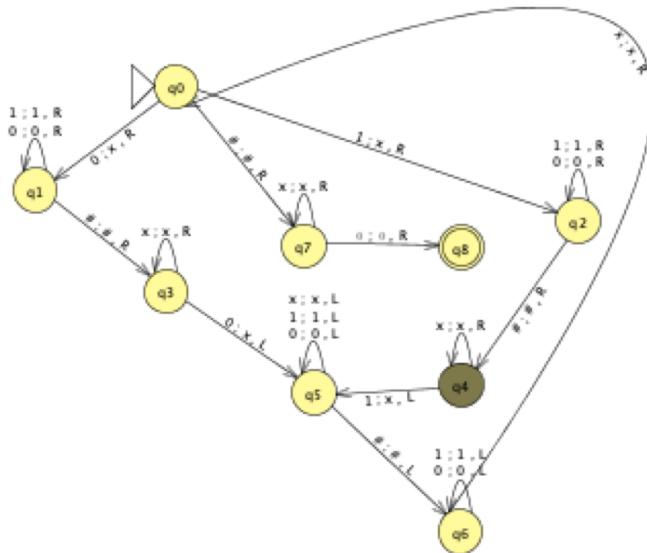


x1#x0



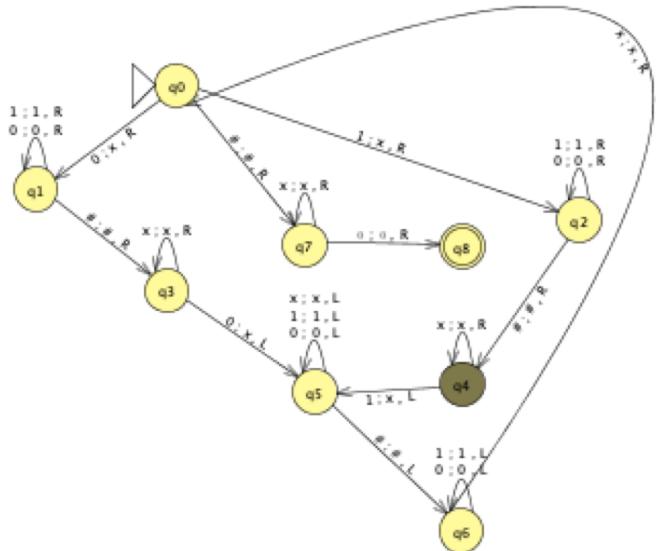
q_2
xx#x0





q_4

{xxxxxxxxxx#x0xxxxxxxxxxxx}



q_4

xxxxxxxx#x0xxxxxxxxxxxx

