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Exercícios Videoaula 07 Gustavo Jodar - 769678

(1) Máquina de Moore para determinar o módulo de 5.

$(x) \bmod 5 = \text{resto}\left(\frac{x}{5}\right) = r \;/\; r$ está em $\{0,1,2,3,4\}$

$(x)_{10} = a_0 \cdot 2^n + a_1 \cdot 2^{n-1} + \dots + a_n \cdot 2^0$ para $n \geq 0$

$(x)_{10} = 2(\underbrace{a_0 \cdot 2^{n-1} + a_1 \cdot 2^{n-2} + \dots a_{n-1}}_{(y)_{10}}) + a_n$

$(x)_{10} = 2 \cdot (y)_{10} + a_n$

$\Downarrow$

$$\begin{cases} a_n = 0 \rightarrow (x)_{10} = 2 \cdot (y)_{10} \\ a_n = 1 \rightarrow (x)_{10} = 2 \cdot (y)_{10} + 1 \end{cases}$$

$\text{resto}\left(\frac{y}{5}\right) = r_y$

$$\begin{cases} a_n = 0 \rightarrow r_x = \text{resto}\left(\frac{2 \cdot r_y}{5}\right) = 2 \cdot r_y \bmod 5 \\ a_n = 1 \rightarrow r_x = \text{resto}\left(\frac{2 r_y + 1}{5}\right) = (2 r_y + 1) \bmod 5 \end{cases}$$

	q_0	q_1	q_2	q_3	q_4		$\delta(q_0)$	$\delta(q_1)$	$\delta(q_2)$	$\delta(q_3)$	$\delta(q_4)$
$a_n = 0$ para $r_y =$	0	1	2	3	4	$r_x =$	0	2	4	1	3
$a_n = 1$ para $r_y =$	0	1	2	3	4	$r_x =$	1	3	0	2	4

$M = (Q, \Sigma, \Delta, \delta, \lambda, q_0)$, $\Sigma = \{0,1\}$; $\Delta = \{0,1,2,3,4\}$

$Q = \{q_0, q_1, q_2, q_3, q_4\}$, $\lambda(q_j) = j$ para $j = 0,1,2,3,4$

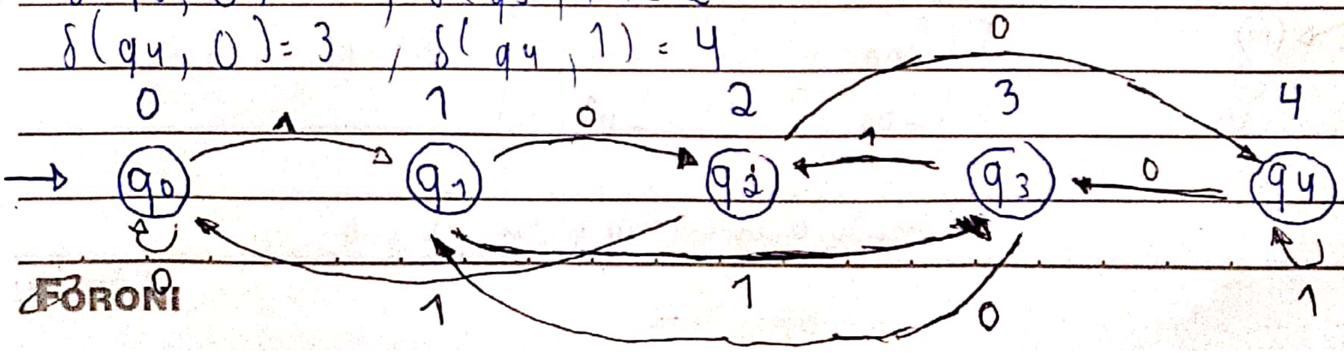
$\delta(q_0, 0) = 0$, $\delta(q_0, 1) = 1$

$\delta(q_1, 0) = 2$, $\delta(q_1, 1) = 3$

$\delta(q_2, 0) = 4$, $\delta(q_2, 1) = 0$

$\delta(q_3, 0) = 1$, $\delta(q_3, 1) = 2$

$\delta(q_4, 0) = 3$, $\delta(q_4, 1) = 4$



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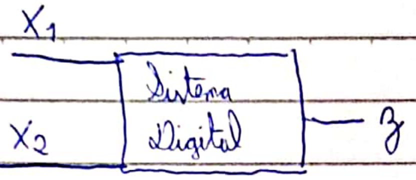
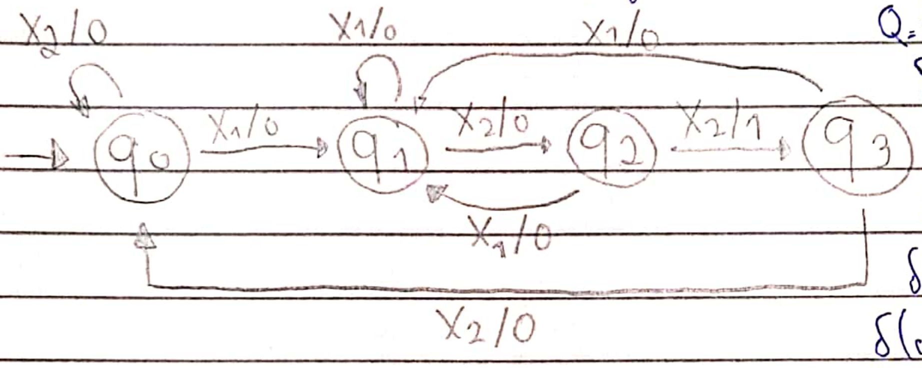
②



$\begin{cases} z = 1 & \text{se termina em } X_1 - X_2 - X_2 \\ z = 0 & \text{caso contrário} \end{cases}$

$\lambda(q_0, X_1) = 0$
$\lambda(q_0, X_2) = 0$
$\lambda(q_1, X_1) = 0$
$\lambda(q_1, X_2) = 0$
$\lambda(q_2, X_1) = 0$
$\lambda(q_2, X_2) = 1$
$\lambda(q_3, X_1) = 0$
$\lambda(q_3, X_2) = 0$

$M_1 =$



$Q = \{q_0, q_1, q_2, q_3\}$
$\Sigma = \{X_1, X_2\}$ $\Delta = \{0, 1\}$
$\delta(q_0, X_1) = q_1$
$\delta(q_0, X_2) = q_0$
$\delta(q_1, X_1) = q_1$
$\delta(q_1, X_2) = q_2$ $\delta(q_3, X_1) = q_1$
$\delta(q_2, X_1) = q_1$ $\delta(q_3, X_2) = q_0$
$\delta(q_2, X_2) = q_3$

$\omega = X_1 - X_1 - X_2 - X_2 - X_2 - X_1 - X_2 - X_2$
estados $= q_0 - q_1 - q_1 - q_2 - q_3 - q_0 - q_1 - q_2 - q_3$
saídas $= 0 - 0 - 0 - 1 - 0 - 0 - 0 - 1$

③ Utilizando o Teorema 2.7.

$Q = \{[q_0, 0], [q_1, 0], [q_2, 0], [q_3, 1]\}$,
$\Sigma = \{X_1, X_2\}$ $\Delta = \{0, 1\}$ $q_0 = [q_0, 0] \to b_0 = 0$

$\delta'([q_0, 0], X_1) = [q_1, 0]$ $\lambda'([q_0, 0]) = 0$
$\delta'([q_0, 0], X_2) = [q_0, 0]$
$\delta'([q_1, 0], X_1) = [q_1, 0]$ $\lambda'([q_1, 0]) = 0$
$\delta'([q_1, 0], X_2) = [q_2, 0]$
$\delta'([q_2, 0], X_1) = [q_1, 0]$ $\lambda'([q_2, 0]) = 0$
$\delta'([q_2, 0], X_2) = [q_3, 1]$
$\delta'([q_3, 1], X_1) = [q_1, 0]$ $\lambda'([q_3, 1]) = 1$
$\delta'([q_3, 1], X_2) = [q_0, 0]$

$\omega = X_1 X_1 X_2 X_2 X_2 X_1 X_2 X_2$
estados $= [q_0, 0] - [q_1, 0] - [q_1, 0] - [q_2, 0] - [q_3, 1] - [q_0, 0] - [q_1, 0] - [q_2, 0] - [q_3, 1]$
saídas $= 0\,0\,0\,0\,1\,0\,0\,0\,1$