LFA Seminar 2

ex 1

Scrieți DFA-uri care să recunoască limbajele urm. peste $\Sigma = \{0, 1\}$

a) $L_1 = \{ w \mid w$ format doar din $0 \}$

b) $L_2 = \{ \mid w \mid_0 \in 2\mathbb{Z} \}$

c) $L_3 = \{ \mid w, 1 \mid \in 2\mathbb{Z}_{+1} \}$

d) $L_4 = \{ w$ nu conține subcuvântul $110 \}$

e) $L_5 = \{ 0^{2n} \mid n \geq 1 \}$

f) $L_6 = \{ 1^{2n+1} \mid n \geq 1 \}$

g) $L_7 = \{ 0^{2n} 1^{2m+1} \mid n, m \geq 1 \}$

ex 2

Fie limbajele L_1 și L_7 de mai devreme și $L_8 = \{ w \in \{0,1\}^* \mid \mid w_0 \mid \in 2\mathbb{Z}$ sau $\mid w_1 \mid \in 2\mathbb{Z}_{+1} \}$

Fără a construi automate să se arate că L_1, L_7, L_8 REG

ex 3

$\Sigma = \{ \text{"/"}, \text{"*"}, a, b \}$

Si scriva un DFA pt. riconosca stringhe ben formate
sopra Σ

ex 1

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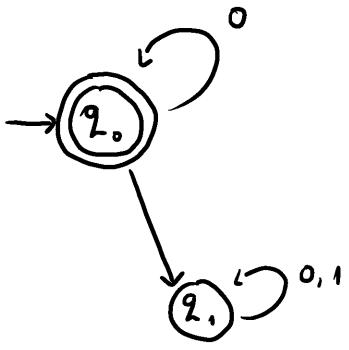
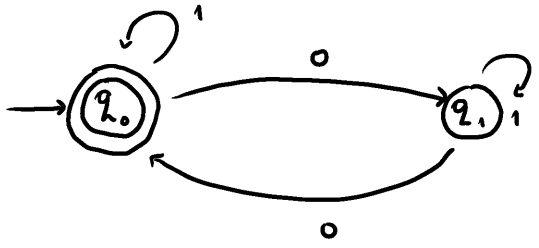
Sol:

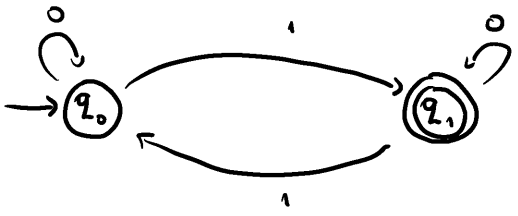
a) $L_1 = \{ w \mid w$ format doar din $0 \}$



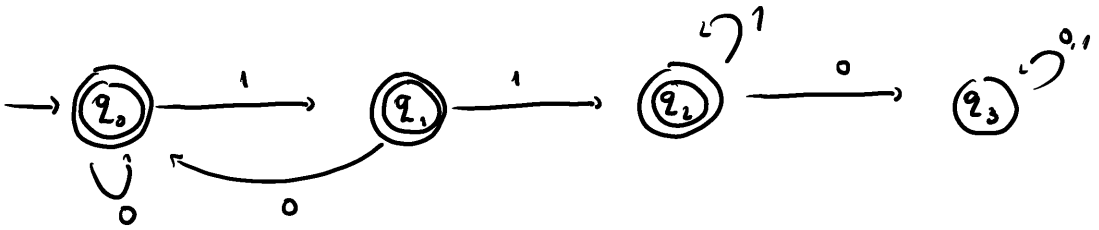
b) $L_2 = \{ |w|_0 \in 2\mathbb{Z} \}$



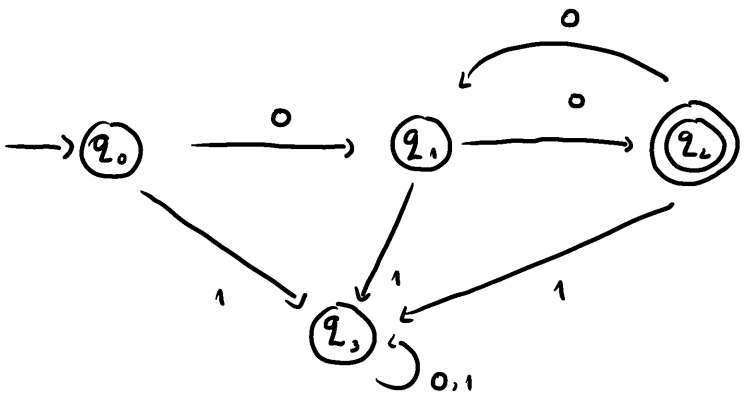
c) $L_3 = \{ |w|_1 \in 2\mathbb{Z}+1 \}$



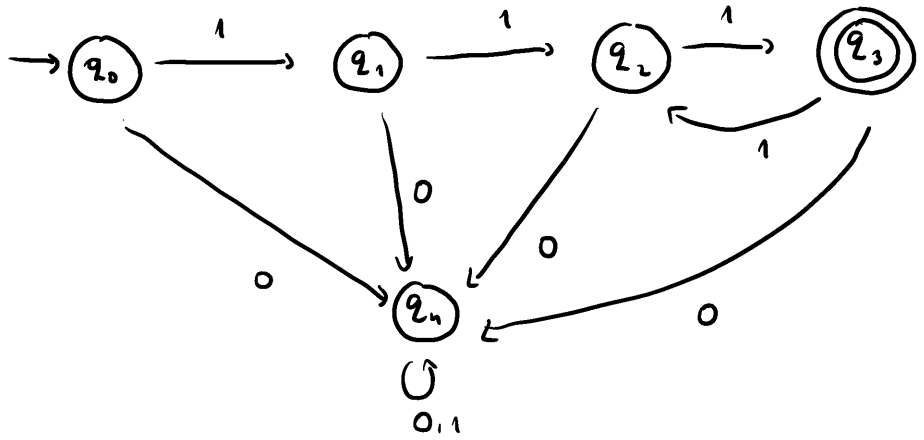
d) $L_4 = \{ w \text{ qui contient le sous-mot } 110 \}$



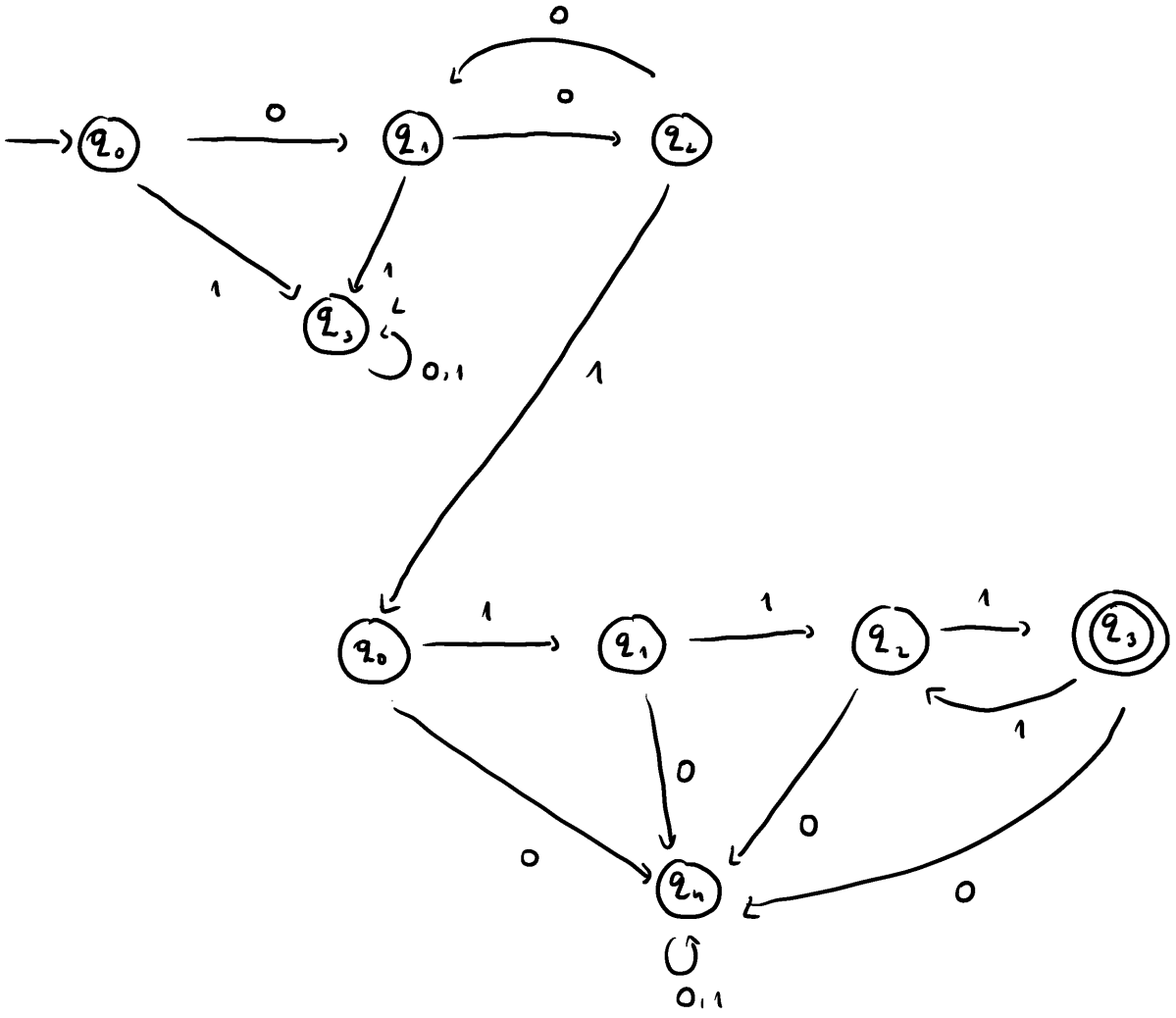
e) $L_5 = \{ 0^{2n} \mid n \geq 1 \}$



f) $L_6 = \{ 1^{2n+1} \mid n \geq 1 \}$



g)



ex 2

Fie limbajele L_1 și L_7 de mai devreme și $L_8 = \{ w \in \{0,1\}^* \mid |w_0| \in 2\mathbb{Z} \text{ sau } |w_1| \in 2\mathbb{Z}+1 \}$

Fără a construi automate să se arate că $L_1, L_7, L_8 \in REG$

Sol

$$L_1, L_2 \in REG \Rightarrow L_1 \cup L_2 \in REG$$
$$\Rightarrow L_1 L_2 \in REG$$
$$L_1 \in REG \Rightarrow L^* \in REG$$

$L_1 \cdot L_2 = \{ w \mid w = w_1 w_2, w_1 \in L_1, w \in L_2 \}$

$L^* = \{ w \mid w = w_1 \dots w_k, w_i \in L \text{ și } k \in \mathbb{N} \}$

$= \bigcup_{k \in \mathbb{N}} L^k$

$L^0 = \{ w^0 \mid w \in L \} = \{ \varepsilon \}$

Deci $\varepsilon \in L^*$

Din ex 1 știm că $L_5, L_6 \in REG$, $L_8 = L_5 \cup L_6$, $L_7 = L_5 \cdot L_6$ $\Rightarrow L_8 \in REG$, $L_7 \in REG$

$L_1 = \{0\}^*$ $\{0\} \in REG \Rightarrow L_1 \in REG$

□

ex 3

$\Sigma = \{ \text{"/"}, \text{"*"}, a, b \}$

Scrieți un DFA pt. comentariile bine formate peste Σ

Exemple

/ * a b * / ✓

/ * * / ✓

/ * * * / ✓

/ * a / * / ✓

a b / * a a * / ✗

/ * a b * / a b ✗

/ * / * * / * / ✗

/ * / ✗