LFA Seminar 3

24 Mar 2025

ex 1

$L \subseteq \Sigma^* \in REG \Rightarrow \overline{L} \in REG$

$\not\Leftarrow$

ex 2

$L_1, L_2 \subseteq \Sigma^* \in REG \Rightarrow L_1 \cap L_2 \in REG$

ex 3

Scrieți automate pentru

minim o dată

a) $\{ w \mid w = 0^* 1^* 0^+)$

b) $\{ w \mid w$ se termină cu $00 \}$

c) $1^* (001^+)^*$

ex 4

Nu e adevărat că pt. orice NFA,

$A = (Q, \Sigma, q_0, \delta, F)$ și $A' = (Q, \Sigma, q_0, \delta, Q \setminus F)$,

avem $L(A') = \overline{L(A)}$

ex 1

$$L \subseteq \Sigma^* \in REG \Rightarrow \overline{L} \in REG$$

$$\#$$

$$\overline{L} = \Sigma^* \setminus L$$

<u>Dem</u>

$$L \in REG \Rightarrow \exists\ A = (Q, \Sigma, \underset{\in Q}{q_0}, \overset{\Sigma \times Q \to Q}{\delta}, \underset{\subseteq Q}{F})$$

un DFA cu $L(A) = L$

Definim $A' = (Q, \Sigma, q_0, \delta, Q / F)$

Vrem $L(A') = \overline{L}$

Fie $\underbrace{w}_{w = w_1, w_2, \dots, w_n} \in \Sigma^*$. Arătam $w \in L(A') \Leftrightarrow w \in \overline{L}$

$w \in L(A') \Leftrightarrow \lambda_n \in Q \setminus F$, unde $\lambda_i = \delta(w_i, q_{i-1})$

pt $1 \leq i \leq n$

$\lambda_0 = q_0$

$\Leftrightarrow \lambda_n \notin F$

$\Leftrightarrow w \notin \underbrace{L(A)}_{= L}$

$\Leftrightarrow w \in \overline{L}$

ex 2

$L_1, L_2 \subseteq \Sigma^* \in REG \Rightarrow L_1 \cap L_2 \in REG$

Dem

$$L_1 \cap L_2 = \overline{\underbrace{\underbrace{\overline{L_1}}_{\in REG} \cup \underbrace{\overline{L_2}}_{\in REG}}_{\in REG}} \in REG$$

î Legile lui Demorgan

$A \cap B = \overline{(\bar{A} \cup \bar{B})}$

$\square$

ex 3

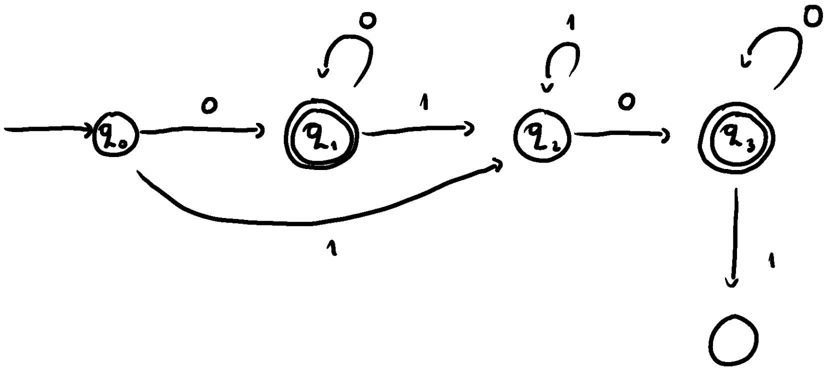
Scrieți automate pentru

a) $\{ w \mid w = 0^* 1^* 0^+)$ minim o dată

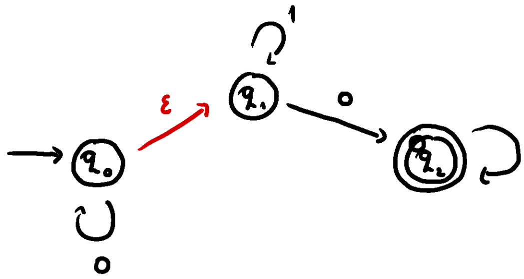
b) $\{ w \mid w$ se termină cu $00 \}$

c) $1^+ (001^+)^*$

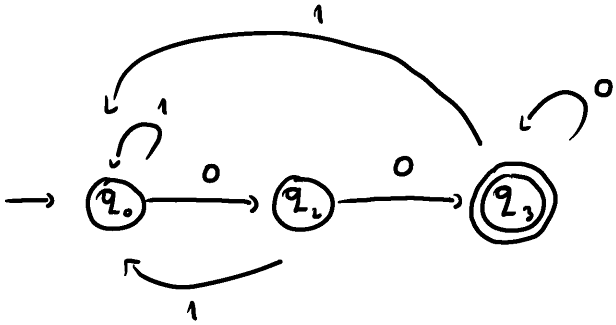
Sol:

a) 

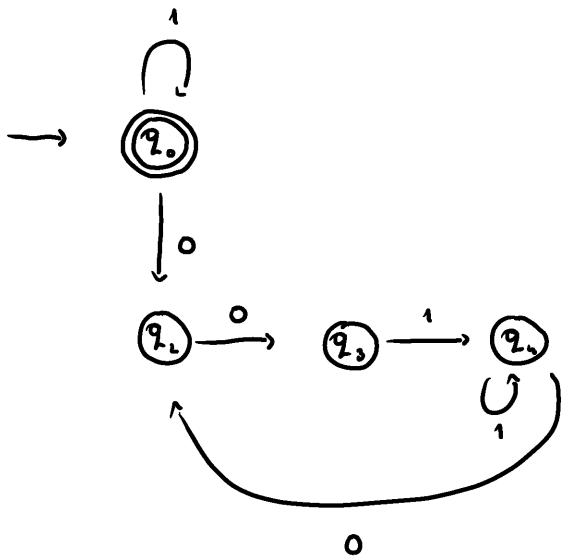
II.



b)



c)

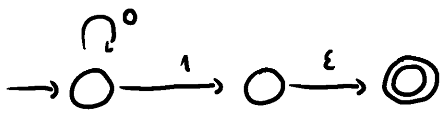


ex 4

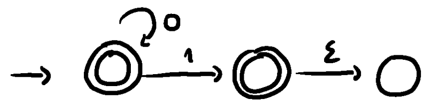
Nu e adevărat că pt. orice NFA, $A = (Q, \Sigma, q_0, \delta, F)$ și $A' = (Q, \Sigma, q_0, \delta, Q \setminus F)$, avem $L(A') = \overline{L(A)}$

Dem

I



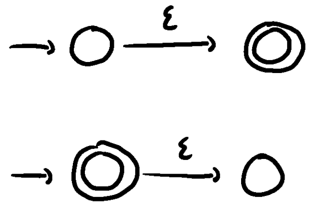
$0^* 1$



11 nu e acceptat

dar $11 \in \overline{0^* 1}$

II



amandouă acceptă doar cuv vid