Lab 03

Monday, October 18, 2021 12:05 PM

Expresii regulate

→ generează limbaje regulate

$\emptyset$	$\mathcal{L}(\emptyset) = \emptyset$
ε	$\mathcal{L}(\varepsilon) = \{\varepsilon\}$
$c \in \Sigma$	$\mathcal{L}(c) = \{c\}$
e^*	$\mathcal{L}(e^*) = \mathcal{L}(e)^*$

e, e_1, e_2 sunt expr. reg.

A o mult. $\rightarrow A^* = \{\varepsilon\} \cup A \cup A^2 \cup A^3 \cup \dots$

$A^i = \{ c_1 c_2 \dots c_i \mid c_1, \dots, c_i \in A \}$

$e_1 e_2$ $\quad \mathcal{L}(e_1 e_2) = \mathcal{L}(e_1)\,\mathcal{L}(e_2)$

A, B mult. $\rightarrow AB = \{ w_1 w_2 \mid w_1 \in A, w_2 \in B \}$

$e_1 \cup e_2$ $\quad \mathcal{L}(e_1 \cup e_2) = \mathcal{L}(e_1) \cup \mathcal{L}(e_2)$

4.1. ① $A = \{0^{2k} \mid k \geq 1\} = \{00, 0000, \dots\}$ $\rightarrow E_1 = 00(00)^*$

$B = \{\varepsilon, 0\}$ $\rightarrow E_2 = 0 \cup \varepsilon$

$AB = \{00, 000, 0000, \dots\} = \{0^k \mid k \geq 2\}$ $\rightarrow E = 000^*$

② $A = \{0^m 1^m \mid m \geq 1\} = \{01, 0011, 000111, \dots\}$ $\quad 011^*$

$B = \{1^m \mid m \geq 1\} = \{1, 11, 111, \dots\}$

$AB = \{0^m 1^k \mid k > m \geq 1\} = \{\underbrace{0^m 1^m}_{A}\ \underbrace{1^m}_{B} \mid m \geq 1, m \geq 1\} = \{0^m 1^{m+m} \mid m, m \geq 1\}$

$BA = \{1^m 0^n 1^m \mid m, m \geq 1\}$

③ $A = \emptyset$

$B = \{1^m \mid m \geq 1\}$

$AB = \emptyset$

$A^* = \emptyset^* = \{\varepsilon\}$

$B^* = \{1^m \mid m \geq 0\} \rightarrow E = 1^*$

4.2:

① gen. expresii aritmetice : numere, +, *

{ 19 + 3*0 + 555 > 5,0 > + > +3 }

003

Notații: $0 \cup 1 \cup 2 \cup \ldots \cup 9 = [0-9]$

$NAT = [1-9][0-9]^* \cup 0$

$[0-9]^*$

$E = NAT\ ((+ \cup *)\ NAT)^*$

② $\mathcal{L} = \{w \in \{0,1\}^* \mid$ orice secv. de 0-uri apare înainte de orice secv. de 1 $\}$

11 00 ✗

101

_ _ _ 11 _ _ _ → 00

100100100001111

$\{0^m 1^m \mid m, m \geq 2\}$ = Limbaj

000 111

0010 1111 ✗

$(0^* \cup 1^*)^* 11^*$ ✗

11 00 11 ∉ $\mathcal{L}$

$(0^* 1)^*$ ✗

11

$(1^* 00 1 1^*)^*$ ✗

1100 11 ∉ $\mathcal{L}$

( )* ( )*

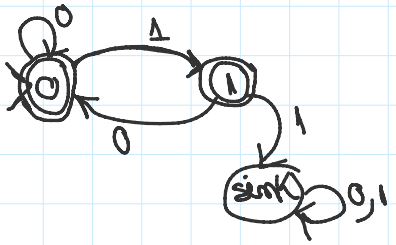
expr. reg. care nu permite secv. de 1

nu p. secv. 0

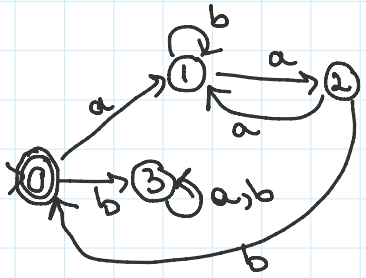
$E = (0\ 0^*\ (\varepsilon \cup 1))^*\ (11^* (\varepsilon \cup 0))^*$

$E = (0 \cup 10)^* (1 \cup 10)^*$

③ DFA pt. $\mathcal{L}((10 \cup 0)^* (1 \cup \varepsilon))$



④ $E = ?$



I: $(a(b \cup (aa)^*) ab)^*$ ← abbab? $\in \mathcal{L}$

II: $(ab^* aa^* b)^*$ ← abaab $\notin \mathcal{L}$?

III: $(ab^* a(ab^* a)^* b)^*$ ✓

IV: $(a(b \cup aa)^* ab)^*$ ✓

V: $(ab^* a(a^* a)^* b)^*$

VI: $(ab + (ab) + b)^*$ ← aab $\in \mathcal{L}$?

⑤ $((ab^* a) + b)^*$

$0 + 00^*$

⑥ $(1 \cup 1(01^*0)1)^*$

1 10111011 , 1100 1

43. 4 CONCAT STAR UNION a b STAR ε 4

4.3.

"CONCAT STAR UNION a b STAR ε"
.split(' ')