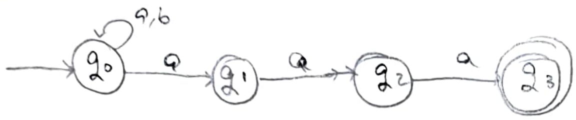
LFA 1

29.05.2024

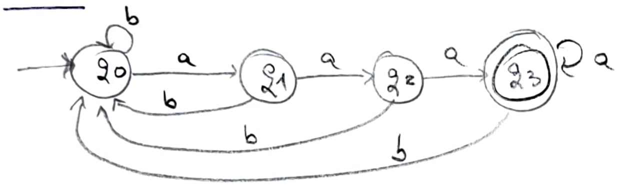
Seminar 7

① $L_1 = \{ waaa \mid w \in \{a,b\}^* \}$

AFN

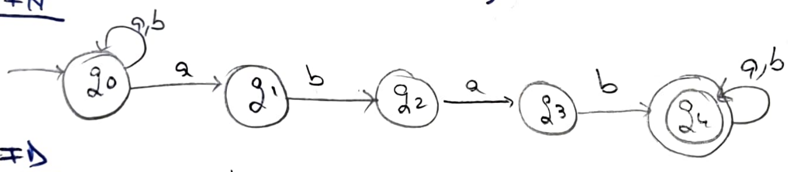


AFD

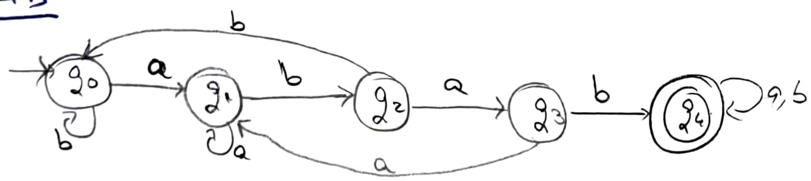


② $L_2 = \{ xababy \mid x,y \in \{a,b\}^* \}$

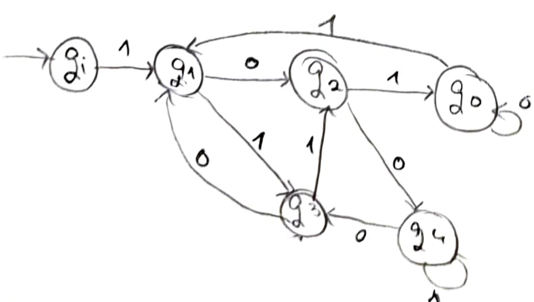
AFN



AFD



③ $L = \{ w \in \{0,1\}^* \mid w = \text{nr. binar} \vdots 5 \}$



④ Urm. perechi de cuvinte sunt sau nu echiv. conform L

$L = \{ a^n b^n \mid n \geq 5 \}$

a) $a^4 b^4 \not\equiv \lambda$ $\quad (a^4 b^4 a^5 b^5 \notin L, \; a^5 b^5 \in L)$

Prelungim cu $a^5 b^5$

b) $a^7b^5 \equiv a^8b^6$ pt $z = b^3 \Rightarrow a^7b^7, a^8b^8 \in L$

pt $z \neq b^2 \Rightarrow a^7b^5z, a^8b^6z \notin L, \forall z \in \{a,b\}^* \setminus \{b^2\}$

c) $a^8b \not\equiv a^7$ $(a^8b\,ab^8 \notin L, a^8b^8 \in L)$

d) $a^{10}b^{10} \equiv a^5b^5$ pt $z = \lambda \Rightarrow a^{10}b^{10}a^5b^5 \in L$

pt $\forall z \in \{a,b^*\} \setminus \lambda \Rightarrow a^{10}b^{10}z, a^5b^5z \notin L$

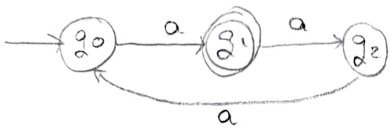
e) $a^{10}b^{10} \not\equiv a^5b^6$ $a^{10}b^{10} \in L, a^5b^6 \notin L$

⑤ $L = \{ a^{3m-5} \mid m \geq 2 \}$

$S \to aA \mid a$

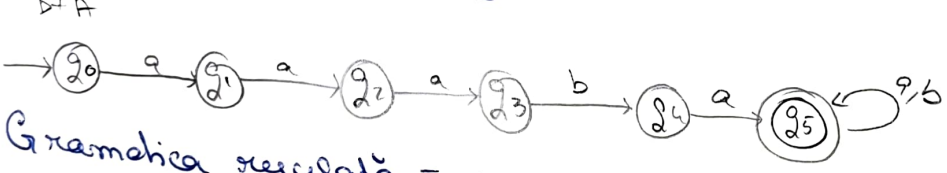
$A \to aB$

$B \to aS$



⑥ $L = \{ aaabaw \mid w \in \{a,b\}^* \}$

DFA



Gramatica regulată ≡ cu expresia regulată $E = aba^*aba(ba)^*a$

$S \to aA$

$A \to bB$

$B \to aB \mid aC$

$C \to bD$

$D \to aE \mid aC$

$E \to a$

scrie

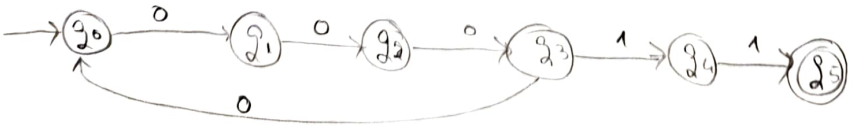
$C \to bD$

$D \to aE$

$E \to bD \mid a$

⑦ $L = \{ 0^{3k}11 \mid k \geq 2 \}$

DFA



Expresie regulată pt DFA-ul de mai sus

$Exp = 000000(000)^*11$

⑧ Gic și APD

$L_7 = \{ a^i b^j c^k \mid i=j \text{ sau } j=k ;\ i,j,k >= 0 \} =$

$= \{ a^i b^i c^* \mid i \geq 0 \} \cup \{ a^* b^k c^k \mid k \geq 0 \}$

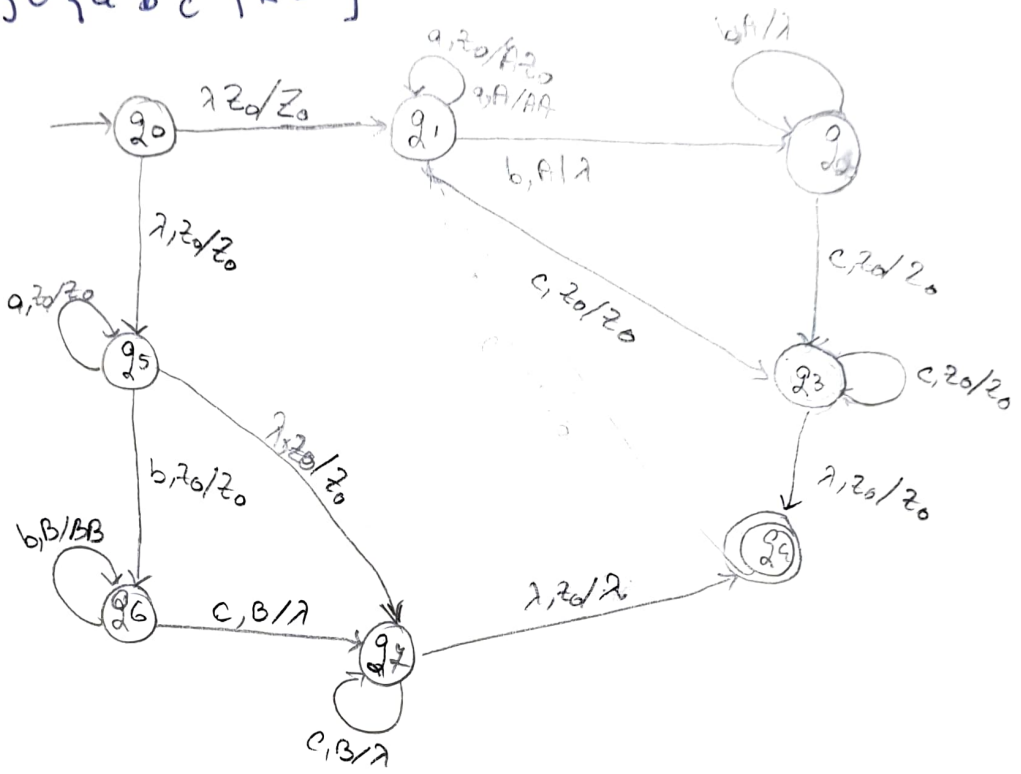
$S \to S_1 \mid S_2$

$S_1 \to S_1 c \mid A$

$A \to aAb \mid \lambda$

$S_2 \to aS_2 \mid B$

$B \to bBc \mid \lambda$



⑨ $L_8 = \{ a^i b^j c^k \mid j > i+k ;\ i,j,k >= 0 \} =$

$= \{ a^i b^i b^n b^k c^k \mid n \geq 1 ;\ i,k \geq 0 \}$

$S \to ABC$

$A \to aAb \mid \lambda$

$B \to bB \mid b$

$C \to bCc \mid \lambda$