

Multimi regulate

Cursul
anterior

Fie Σ un alfabet.

Multimile regulate peste Σ se definesc recursiv astfel:

1. Φ - multime reg. peste Σ
2. $\{\varepsilon\}$...
3. $\{a\}$ daca: $a \in \Sigma$
4. $RU S$ daca R, S – multimi regulate peste Σ +
5. RS daca R, S – multimi regulate peste Σ
6. R^* daca R – multime regulara peste Σ
7. Orice alta multime regulara se obtine aplicand de un numar finit de ori reg. 1-6

Multimi regulate si expresii regulate

- Expresii regulate

1.	Φ	expr. reg. coresp. m.reg.	Φ
2.	ε		$\{\varepsilon\}$
3.	a	daca: $a \in \Sigma$	$\{a\}$
4.	$r+s$	daca r,s – expresii regulate	$R \cup S$
5.	rs	daca r,s – expresii regulate	RS
6.	r^*	daca r – expresie regulara	R^*
7.	Orice alta expr. reg. se obtine aplicand de un numar finit de ori reg. 1-6		

$r \mid s$

- Expresii regulate echivalente:

- mult. regulate reprezentate de acestea sunt egale

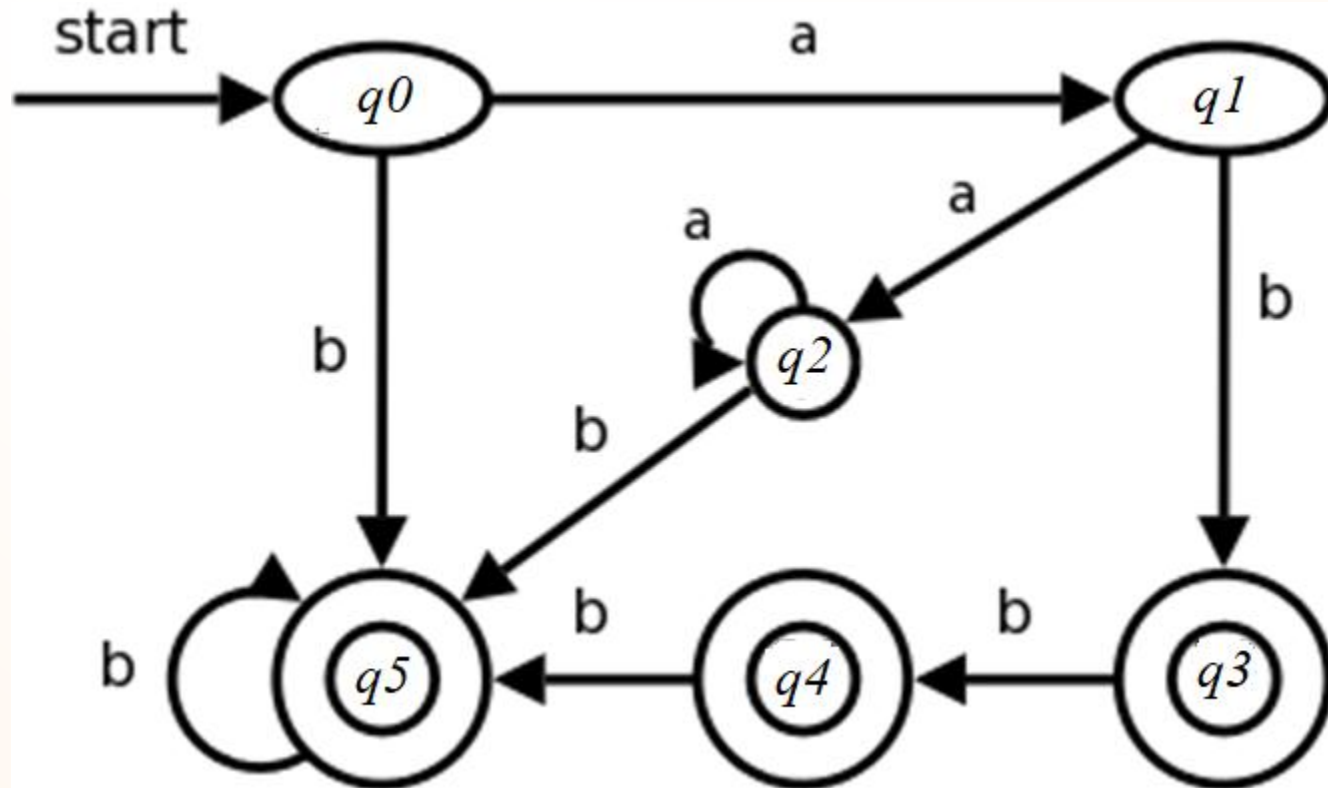
Expresii regulate

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- expresiile regulate – secv. obtinute prin concatenarea de simb. din $\Sigma \cup \{\Phi, \varepsilon, +, *, (,)\}$ (... prioritate ...)
- multimile regulate asociate expresiilor regulate sunt limbaje regulate

\Rightarrow orice expresie regulara peste Σ
este un limbaj regular

Expresii regulate si AF (exemplu)



Care este expresia regulara ce il descrie pe $L(M)$?

Proprietati: expresii regulate echivalente

- “ = ” noteaza relatia dintre 2 expresii regulate echivalente

(reuniune si concaten.)

$$\begin{aligned}r + s &= s + r \\(r + s) + t &= r + (s + t) \\(rs) t &= r (st) \\(r + s) t &= rt + st \\r (s + t) &= rs + rt\end{aligned}$$

(utilizarea lui Φ si ε)

$$\Phi + r = r + \Phi = r$$

$$\varepsilon r = r \varepsilon = r$$

$$\Phi r = r \Phi = \Phi$$

$$\Phi^* = \varepsilon$$

$$r^* + \varepsilon = \varepsilon + r^* = r^*$$

$$(\varepsilon + r)^* = r^*$$

$$(r^*)^* = r^*$$

$$(r^* s^*)^* = (r + s)^*$$

Expresii regulate

Exercitiu:

Fie r, s – expresii regulate oarecare

Demonstrati ca:

- $r^* r^* = r^*$
- $(r^*)^* = r^*$
- $(r^* s^*)^* = (r + s)^*$