

Multimi regulate

Fie Σ un alfabet.

Multimile regulate peste Σ se definesc recursiv astfel:

1. Φ este o m. 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 | | |

- Expresii regulate echivalente:

- mult. regulate reprezentate de acestea sunt egale

Expresii regulate

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

=> orice expresie regulara peste Σ
este un limbaj regular

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:

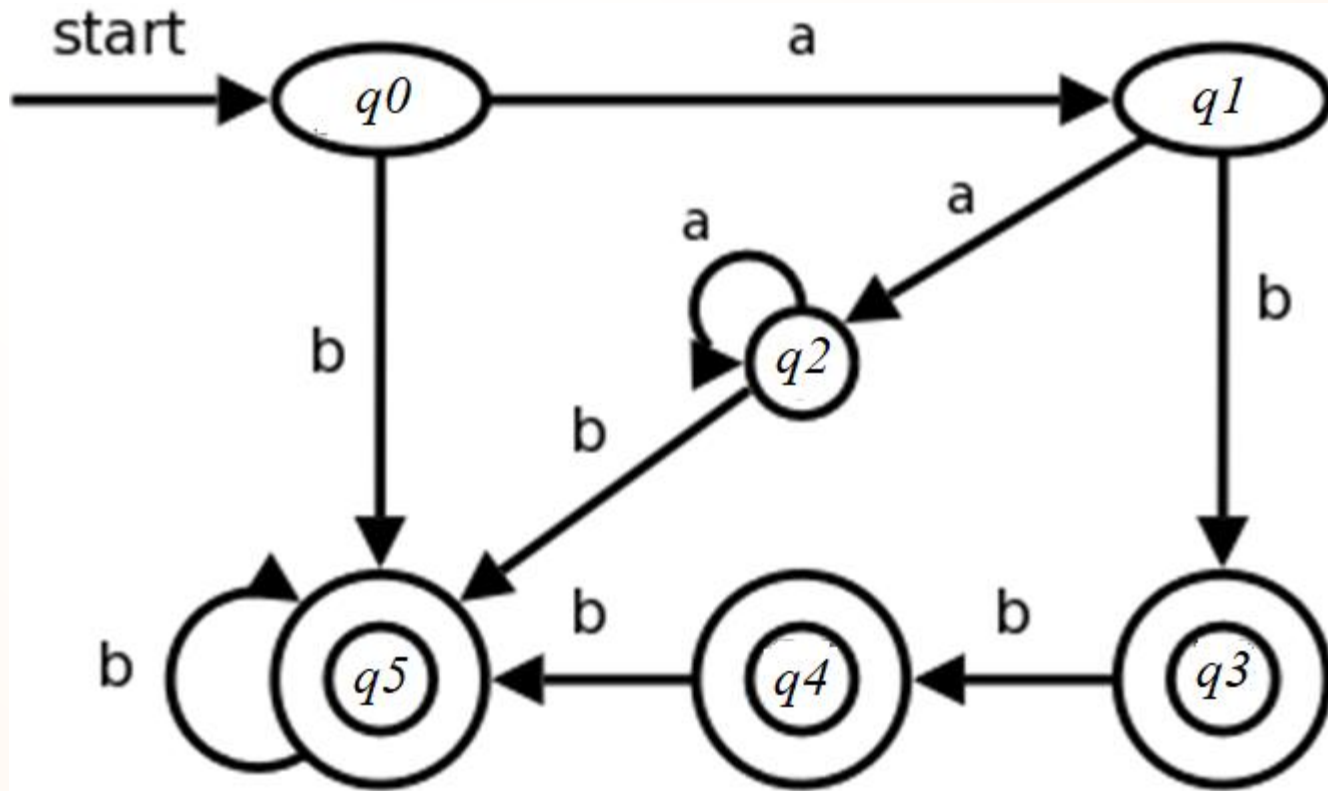
Fie r, s – expresii regulate oarecare
PP ca am demonstrat ca:

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

Demonstrati ca:

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

Expresii regulate si AF (exemplu)



Cine este $L(M)$?