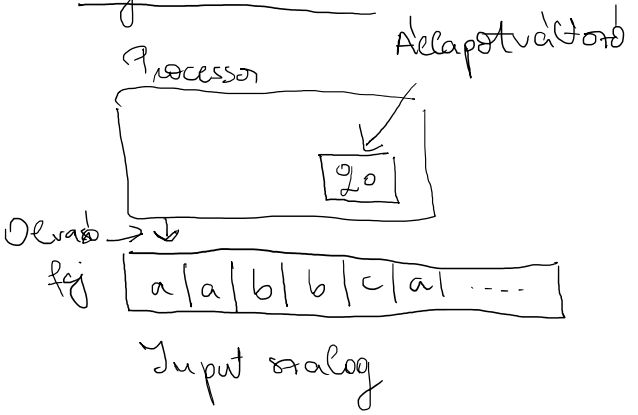
# Gyak4

Thursday, March 4, 2021 11:23 AM

Előző órán: - reguláris kifejezések
- átalakítás 3-as típusú grammatikába.

## Véges automata

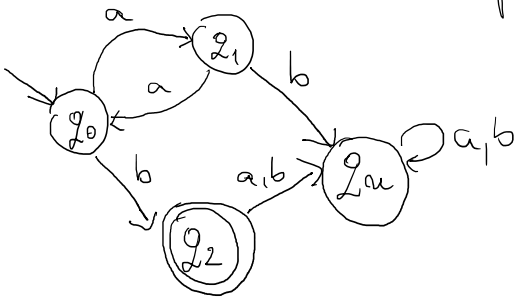


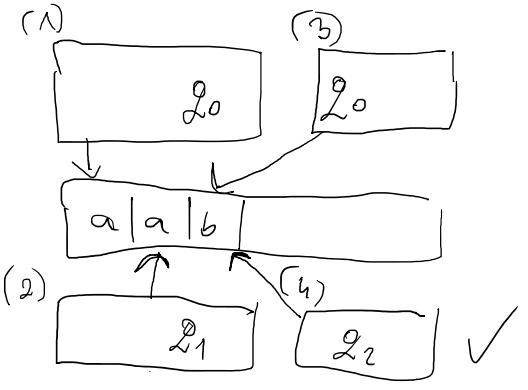

$A = (Q, T, \delta, q_0, F)$

- $Q$: állapotok halmaza (véges, $\neq \emptyset$)
- $T$: input szimbólumok halmaza/ábécéje
- $q_0 \in Q$: kezdőállapot
- $F \subseteq Q$: elfogadó állapotok halmaza
- $\delta: Q \times T \to Q$: állapot átmeneti fgv.

## 1) $L = \{ a^{2n} b \mid n \geq 0 \}$

pl: aab, b, aaaab, ...

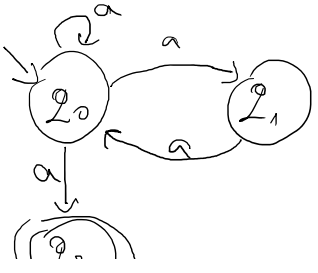


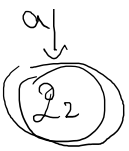

✓

| | a | b |
|---|---|---|
| $q_0$ | $q_1$ | $q_2$ |
| $q_1$ | $q_0$ | $q_n$ |
| $q_2$ | $q_n$ | $q_n$ |
| $q_n$ | $q_n$ | $q_n$ |

## 2)




| | a |
|---|---|
| → $q_0$ | $\{q_0, q_1, q_2\}$ |
| $q_1$ | $q_0$ |
| ← 9 | |




| | $Z_1$ | $Z_0$ |
|---|---|---|
| $\leftarrow q_2$ | | |

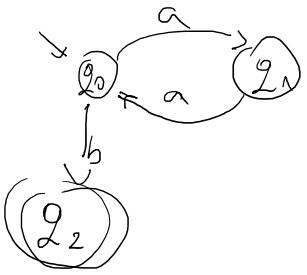
Redukció $A=(Q, T, \delta, q_0, F)$

(egylépésben) $u, v \in QT^*$ $\quad u \underset{A}{\Rightarrow} v$ ha $\exists w \in T^* : u = qaw,\ v = pw$

$\delta(q, a) = p$

(többlépésben) : $u \overset{*}{\underset{A}{\Rightarrow}} v$

3.




Input: aaaab

$Q\ T^*$

$q_0 aaaab \Rightarrow q_1 aaab \Rightarrow q_0 aab \Rightarrow$

$\Rightarrow q_1 ab \Rightarrow q_0 b \Rightarrow q_2$ ✓

Input: ab

$q_0 ab \Rightarrow q_1 b$ ✗

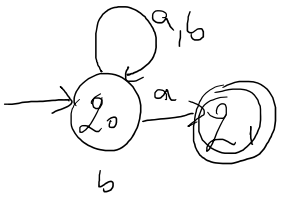
Elfogadott / felismert nyelv:

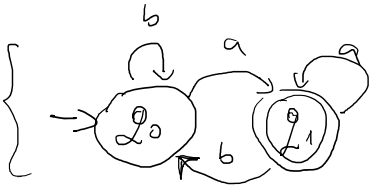
$$L(A) = \{ u \in T^* \mid q_0 u \overset{*}{\underset{A}{\Rightarrow}} p ;\ q_0 \in Q ;\ p \in F \}$$

4. $(a+b)^* a$

$S \to aS \mid bS \mid aV$

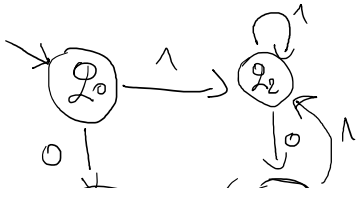
$V \to \varepsilon$




a

5. $1(1+0)^* 0 + 0$

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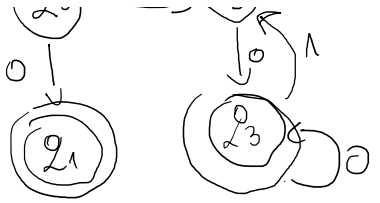
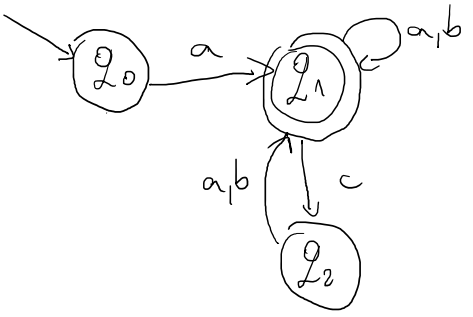
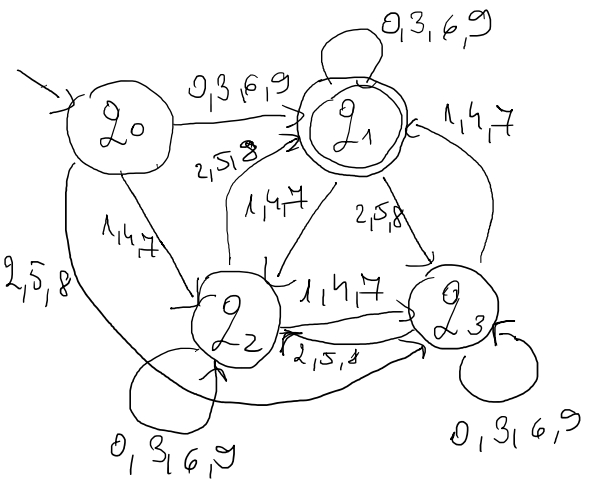
$(1(1+0)^*0) + 0$

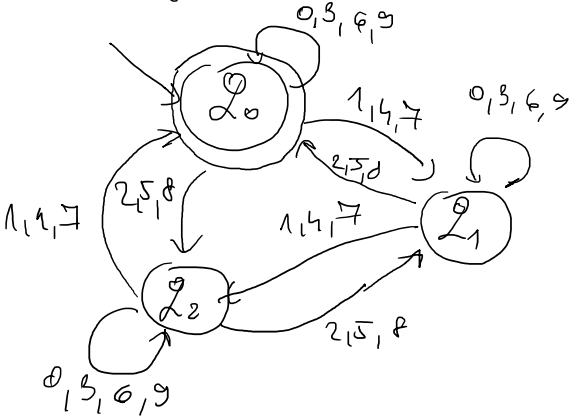



6. $a(a+b+c(a+b))^*$ aab cacb

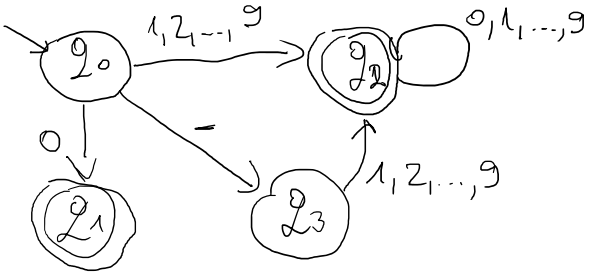



7. 3-mal osztható decimális számokat elfogadó automata




8. decimális egészeket fogadó: $0, 1, 22_3, -1, -2$



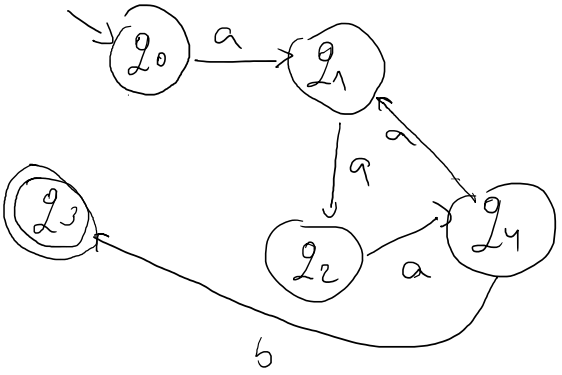

Input: $-223$

$q_0 - 223 \Rightarrow q_3 223 \Rightarrow q_2 23 \Rightarrow$

$\Rightarrow q_2 3 \Rightarrow q_2$ ✓

$q_0 - 223 \overset{*}{\underset{A}{\Rightarrow}} q_2 \quad q_2 \in F$

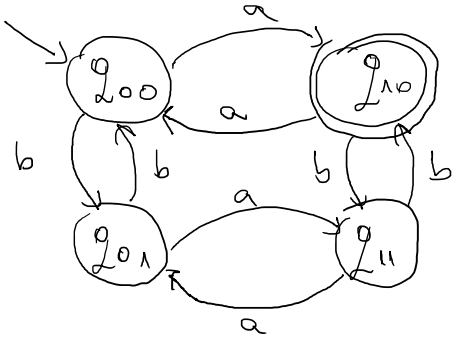
9. $(aaa)^+ b$ : aaab, aaaaaab, ... ✗




10. $L = \{ u \in \{a,b\}^* \mid e_a(u) \bmod 2 = 1 \wedge e_b(u) \bmod 2 = 0 \}$

a, bab, abb, bba, abbbb, babbb, ...

| | páros a | páratlan a |
|---|---|---|
| ps b | $q_0$ ($q_{00}$) | $q_1$ ($q_{10}$) |
| ptl b | $q_2$ ($q_{01}$) | $q_3$ ($q_{11}$) |




Input: babaa

$q_{00}$babaa $\Rightarrow$ $q_{01}$abaa $\Rightarrow$

$\Rightarrow$ $q_{11}$baa $\Rightarrow$ $q_{10}$aa $\Rightarrow$

$\Rightarrow$ $q_{00}$a $\Rightarrow$ $q_{10}$ ✓