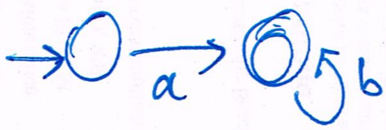
Sprachen („regulär")

- Automat: 

$L = \{ab^n \mid n \in \mathbb{N}_0\}$

- Grammatik:

$S \to aB$
$B \to bB \mid \varepsilon$

$S \Rightarrow aB \Rightarrow abB \Rightarrow abbB \Rightarrow abb\varepsilon$
$= abb$

- regulärer Ausdruck: ab^*

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allgem. Grammatik:

$S \to BaaBa$
$Bc \to bBbc$
$Ba \to aB \mid \varepsilon$

$S \Rightarrow BaaBa \Rightarrow a\underbrace{Ba}Ba \Rightarrow a\cancel{a}Ba$
$\Rightarrow a\cancel{a}\cancel{a}$

Bsp.: $S \to aSb \mid \varepsilon$

Bsp.: $S \to aS$ | $S \Rightarrow^* a^k S \quad (k \in \mathbb{N}_0)$

$$\left.\begin{array}{l} e_1 \text{ reg. Ausdr.,} \\ e_2 \quad \text{"} \quad \text{"} \end{array}\right\} \Rightarrow [e_1 | e_2] \text{ reg. A.}$$

$$\Rightarrow [e_1 \bullet e_2] \text{ reg. A.}$$

$$abc : [[a \bullet b] \bullet c] \qquad (a|b|c)$$

$$[a \bullet [b \bullet c]] \qquad (a|(b|c))$$

$$L(\alpha)$$

$$L(\alpha^*) = L(\alpha^0) \cup \underline{L(\alpha^1)} \cup L(\alpha^2) \cup \dots$$

$$= \bigcup_{k=0}^{\infty} L(\alpha^k)$$

$$L(\alpha^1) = L(\alpha)$$

$$L(\alpha^2) = (L(\alpha))^2$$

$$L(\alpha\beta) = L(\alpha)L(\beta)$$

$$= \{w = w_1 w_2 \mid w_1 \in L(\alpha), w_2 \in L(\beta)\}$$

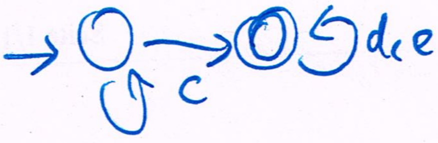
$$L(\alpha^0) := \{\varepsilon\}$$

$$\underline{L(\alpha^k)} = L(\alpha^{k+0}) = \underline{L(\alpha^k)} \cdot \underbrace{L(\alpha^0)}_{\{\varepsilon\}}$$

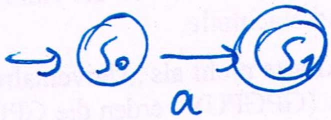
$$L(\alpha^{m+n}) = L(\alpha^m) L(\alpha^n)$$

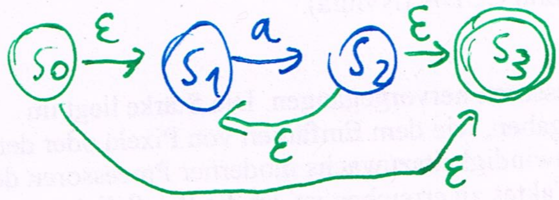
Frage: $\alpha \equiv \alpha bb$? $\quad w = wbb \quad ↯$

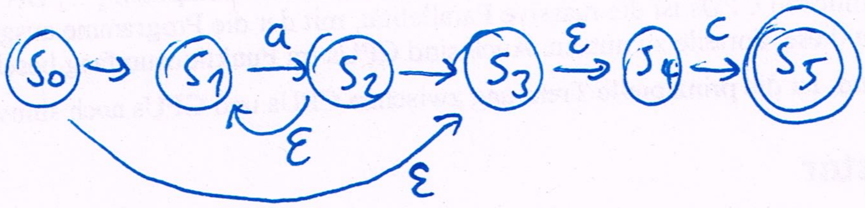
$a^* c (d|e)^*$

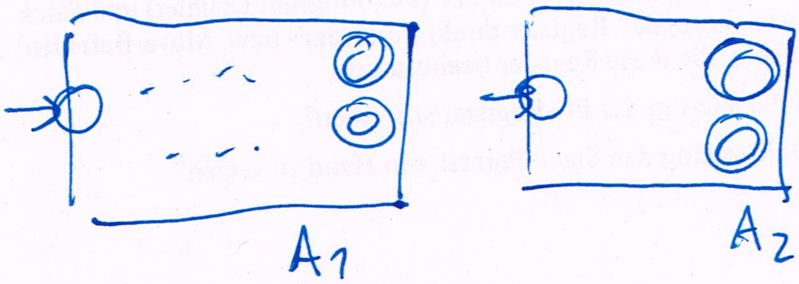


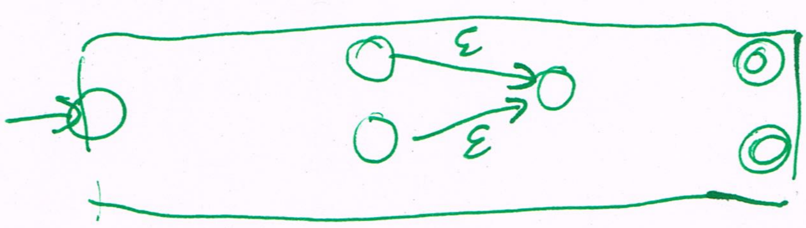
Formale Lösung:

a: 

a^*: 

$a^* c$: 





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Ableitungen:

6.4 rechtslin

$S \Rightarrow aT$
$\Rightarrow abT$
$\Rightarrow abbT$
$\Rightarrow abbbT$
$\Rightarrow abbbc$

6.5 linkslin.

$S \Rightarrow Td$
$\Rightarrow Tcd$
$\Rightarrow Tccd$
$\Rightarrow Tcccd$
$\Rightarrow Ucccd$
$\Rightarrow Ubcccd$

6.6

$(aab \mid bba)(cc)^*$: $L = \{ w(cc)^k \mid w \in \{aab, bba\}, k \in \mathbb{N}_0 \}$