

Übung 1 (b)

Wort	Markenkeller
ε	1
a	31
aa	3 1
aab	1
aab	2
aaba	52
aabab	752
aababa	7 52
aababab	5 2
aabababb	2
aabababb	-

Übung 3 (a)

$$V = \{S, A, B\}$$

$$R = \{S ::= ABA,$$

$$A ::= aa\hat{a}\hat{a},$$

$$B ::= (\hat{b}bBbbb\hat{b}\hat{A})\}$$

Übung 3 (b)

$$\begin{aligned}\llbracket \widehat{(aSa\widehat{\llbracket b \rrbracket})} \rrbracket(\rho) &= \llbracket aSa \rrbracket(\rho) \cup \llbracket \widehat{\llbracket b \rrbracket} \rrbracket(\rho) \\ &= \llbracket a \rrbracket(\rho) \cdot \llbracket S \rrbracket(\rho) \cdot \llbracket a \rrbracket(\rho) \cup (\llbracket b \rrbracket(\rho) \cup \{\varepsilon\}) \\ &= \{a\} \cdot \rho(S) \cdot \{a\} \cup (\{b\} \cup \{\varepsilon\}) \\ &= \{a^n w a^n \mid n \geq 1, w \in \{\varepsilon, b\}\} \cup \{\varepsilon, b\} \\ &= \rho(S)\end{aligned}$$

Übung 3 (c)

Wort	Markenkeller
a	1
acd	1
acd	1
acdc	21
acdccd	21
acdccdd	1
acdccddb	-

Übung 4 (a)

$$V = \{S, A, B\}$$

$$R = \{S ::= \hat{(aSa|A)}\},$$

$$A ::= \widehat{(aA[b] \widehat{\widehat{B}})},$$

$$B ::= \widehat{\widehat{(a|b)}}\widehat{\widehat{}}$$

Übung 4 (b)

$$f(\rho) = \begin{pmatrix} f(\rho)(S) \\ f(\rho)(A) \end{pmatrix} = \begin{pmatrix} \llbracket \hat{[aAb]} \rrbracket(\rho) \\ \llbracket \hat{[Sc|cS]} \rrbracket(\rho) \end{pmatrix} = \begin{pmatrix} \{a\} \cdot \rho(A) \cdot \{b\} \cup \{\varepsilon\} \\ \rho(S) \cdot \{c\} \cup \{c\} \cdot \rho(S) \end{pmatrix}$$

$$\begin{pmatrix} \emptyset \\ \emptyset \end{pmatrix} \mapsto \begin{pmatrix} \{\varepsilon\} \\ \emptyset \end{pmatrix} \mapsto \begin{pmatrix} \{\varepsilon\} \\ \{c\} \end{pmatrix} \mapsto \begin{pmatrix} \{\varepsilon, acb\} \\ \{c\} \end{pmatrix} \mapsto \begin{pmatrix} \{\varepsilon, acb\} \\ \{c, acbc, cacb\} \end{pmatrix} \\ \mapsto \begin{pmatrix} \{\varepsilon, acb, aacbc, acacbb\} \\ \{c, acbc, cacb\} \end{pmatrix}$$