

# Lösung 14. Übung AuD

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a)

- ▶  $V = \{S, A, C\}$
- ▶  $R = \{S ::= \hat{a}Sd\hat{d}A\hat{c}\hat{d}, A ::= \hat{a}Ab\hat{a}b\}$

b)

$$f(\varrho)(X) = \{\varepsilon\} \cup (\{a\} \circ \varrho(Y)),$$

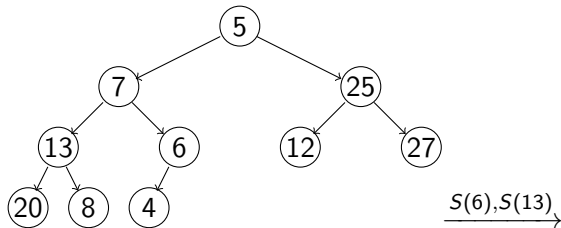
$$f(\varrho)(Y) = (\varrho(X) \circ \{b\}) \cup (\varrho(X) \circ \{bb\})$$

$$\begin{aligned} \begin{pmatrix} X \\ Y \end{pmatrix} : \begin{pmatrix} \emptyset \\ \emptyset \end{pmatrix} &\rightarrow \begin{pmatrix} \{\varepsilon\} \\ \emptyset \end{pmatrix} \\ &\rightarrow \begin{pmatrix} \{\varepsilon\} \\ \{b, bb\} \end{pmatrix} \rightarrow \begin{pmatrix} \{\varepsilon, ab, abb\} \\ \{b, bb\} \end{pmatrix} \\ &\rightarrow \begin{pmatrix} \{\varepsilon, ab, abb\} \\ \{b, bb, abb, abbb, ab^4\} \end{pmatrix} \rightarrow \begin{pmatrix} \{\varepsilon, ab, abb, aabb, aabbb, aab^4\} \\ \{b, bb, abb, abbb, ab^4\} \end{pmatrix} \end{aligned}$$

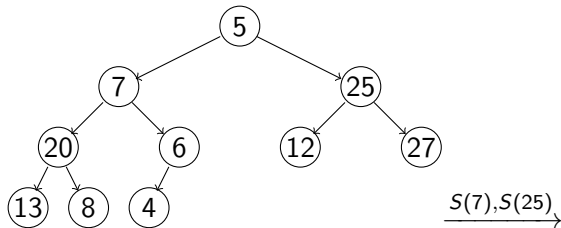
c)

$$W(\mathcal{E}) = \{a^n b^{n+m} \mid 0 \leq m \leq n\}$$

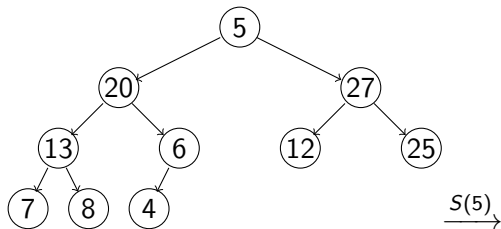
# Anfang



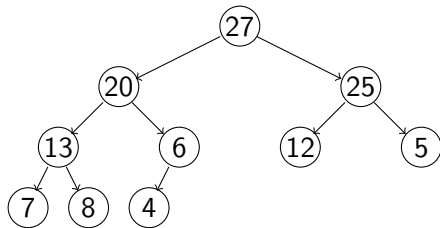
# Phase 1



# Phase 1

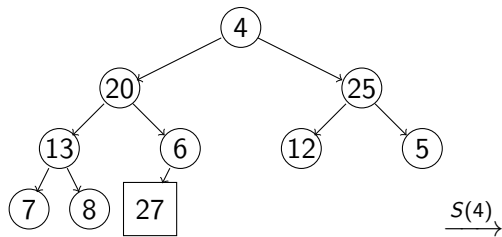


# Phase 1

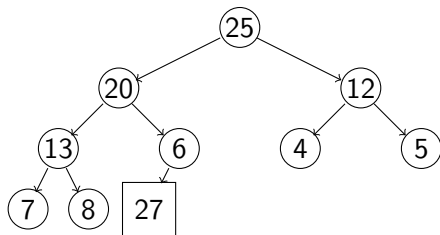




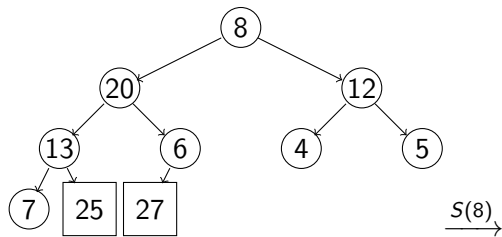
## Phase 2



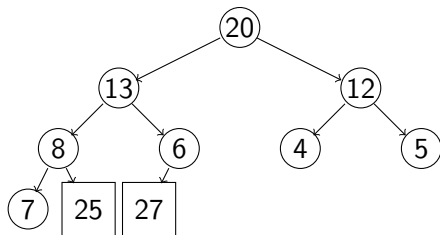
## Phase 2



## Phase 2



## Phase 2



a)

mehrere Lösungen möglich

(1, 0, -)	(2, 6, 1), (3, 2, 1), (4, 7, 1)
(3, 2, 1)	(2, 3, 3), (4, 6, 3), (6, 9, 3)
(2, 3, 3)	(4, 6, 3), (6, 9, 3), (5, 16, 2)
(4, 6, 3)	(6, 9, 3), (5, 16, 2), (7, 7, 4)
(7, 7, 4)	(6, 9, <b>3</b> ), (5, 16, 2), (8, 18, 7)
(6, 9, <b>3</b> )	(5, 12, 6), (8, 18, 7)
(5, 12, 6)	(8, 16, 5)
(8, 16, 5)	-

a), b)

Knoten	Distanz	Pfad
1	0	[1]
2	3	[1, 3, 2]
3	2	[1, 3]
4	6	[1, 3, 4]
5	12	[1, 3, 6, 5] <i>oder</i> [1, 3, 4, 7, 6, 5]
6	9	[1, 3, 6] <i>oder</i> [1, 3, 4, 7, 6]
7	7	[1, 3, 4, 7]
8	16	[1, 3, 6, 5, 8] <i>oder</i> [1, 3, 4, 7, 6, 5, 8]

a)

Objekt	Bereich
g	3-36
f	5-36
a, b	5-16
c	6-16
d, e	18-26
main	28-36
m, n	29-36

b)

Haltepunkt	RM	1	2	3	4	5	6	7	8	9	10
7	-	m 2	n 4								
1	3			a #1	b #2	c 2					
2	3			a #1	b #2	c 3					
4	1:3						d 3	e #2			



b)

Haltepunkt	RM	1	2	3	4	5	6	7	8	9	10
5	1:3	3					d 3	e #2			
1	2:1:3								a #6	b #2	c 3
6	1:3						d 3	e e#2			
3	3	3		a #1	b #2	c 3					

b)

Haltepunkt	RM	1	2	3	4	5	6	7	8	9	10
3	-	m 3	n 3								

a)

Position	0	1	2	3	4	5	6	7
Pattern	a	a	b	a	a	a	b	b
Verschiebetabelle	-1	-1	1	-1	-1	2	-1	3

b)

Position	0	1	2	3	4	5
Pattern	b	b	a	b	b	c
Verschiebetabelle	-1	-1	1	-1	-1	2

a)

$$A(\text{"A gewinnt"}) = \{(1, 2), (2, 1), (2, 3)\}$$

$$A(\text{"B gewinnt"}) = \{(1, 1), (1, 3), (2, 2)\}$$

$$h(\text{"A gewinnt"}) = 60$$

$$h(\text{"B gewinnt"}) = 27$$

b)

Durch Multiplikation der Einzelwahrscheinlichkeiten, bsp.  $q_0(1, 2) = q_0^x(1) \cdot q_0^y(2)$

X	(1,2)	(2,1)	(2,3)	(1,1)	(1, 3)	(2,2)
$q_0$	2/15	1/15	1/5	2/15	2/5	1/15

c)

Errechnet durch Aufteilen des Korpus mit der bedingten Wahrscheinlichkeit, bsp.

$$h_1(1, 2) = h(\text{"Agewinnt"}) \cdot \frac{q_0(1, 2)}{q_0(1, 2) + q_0(2, 1) + q_0(2, 3)}$$

X	(1,2)	(2,1)	(2,3)	(1,1)	(1, 3)	(2,2)
$h_1$	20	10	30	6	18	3

c)

Errechnet durch Addieren aller “günstigen” Fälle, bsp.

$$h_1^x(1) = h_1(1, 1) + h_1(1, 2) + h_1(1, 3)$$

x	1	2
$h_1^x$	44	43

y	1	2	3
$h_1^y$	16	23	48



d)

x		1		2		
$q_1^x$		44/87		43/87		
y		1		2		3
$q_1^y$		16/87		23/87		48/87