Musterlösung 7. Gruppenübung
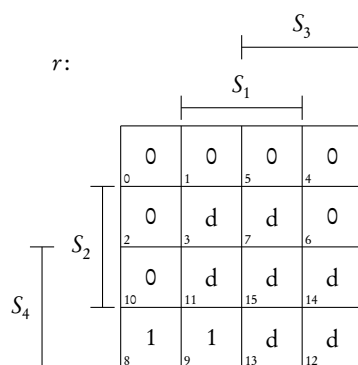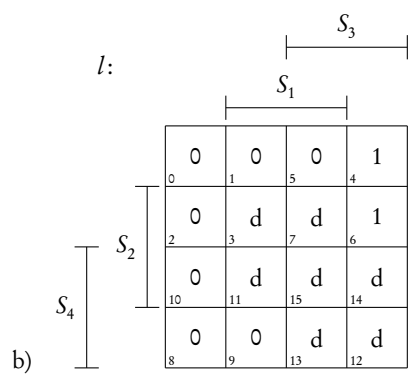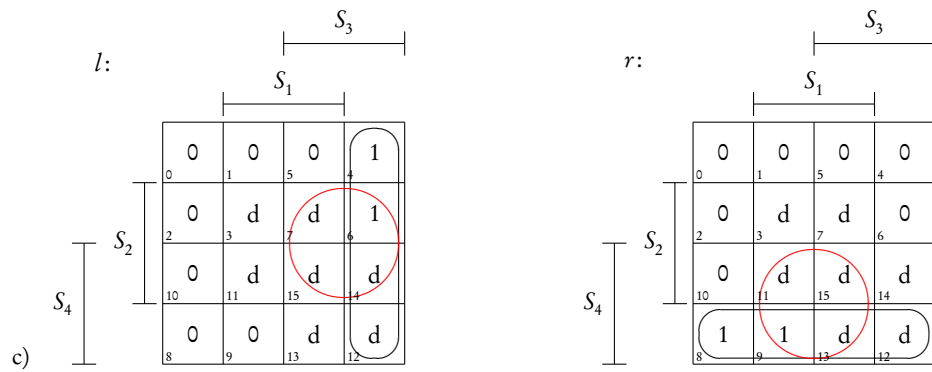
Digitaltechnik und Rechnersysteme • Wintersemester 2025/2026

1.1 Transportwagensteuerung

a)

S_4	S_3	S_2	S_1	l	r
0	0	0	0	0	0
0	0	0	1	0	0
0	0	1	0	0	0
0	0	1	1	d	d
0	1	0	0	1	0
0	1	0	1	0	0
0	1	1	0	1	0
0	1	1	1	d	d
1	0	0	0	0	1
1	0	0	1	0	1
1	0	1	0	0	0
1	0	1	1	d	d
1	1	0	0	d	d
1	1	0	1	d	d
1	1	1	0	d	d
1	1	1	1	d	d

b)

$l:$ $r:$

l: (S_3, S_1, S_2, S_4)

0 [0]	0 [1]	0 [5]	1 [4]
0 [2]	d [3]	d [7]	1 [6]
0 [10]	d [11]	d [15]	d [14]
0 [8]	0 [9]	d [13]	d [12]

r: (S_3, S_1, S_2, S_4)

0 [0]	0 [1]	0 [5]	0 [4]
0 [2]	d [3]	d [7]	0 [6]
0 [10]	d [11]	d [15]	d [14]
1 [8]	1 [9]	d [13]	d [12]

c)

Rot markierte Primimplikanten sind API's, der Rest sind KPI's.

d) kostengünstigste DNF:

$$l(S_1, S_2, S_3, S_4) = \overline{S_1}\, S_3$$

$$r(S_1, S_2, S_3, S_4) = \overline{S_2}\, S_4$$

$\overline{S}_1$ —
S_3 — & — l

$\overline{S}_2$ —
S_4 — & — r

e)