## Praktikum Rechnerstrukturen 02

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\underline{2.2a}
f\!\!:\mathbb{B}^4\to\mathbb{B}^6
f(x_3, x_2, x_1, x_0) = (y_5, y_4, y_3, y_2, y_1, y_0) für
y_0 = (x_3 \vee x_2 \vee x_1 \vee x_0)
y_1 = (x_3 \vee (x_2 \wedge x_1))
y_2 = (x_3 \lor (x_2 \land x_1 \land x_0))
y_3 = (x_3 \land \neg (x_2 \land x_1 \land x_0))
y_4 = ((x_3 \wedge x_2) \vee (x_3 \wedge x_1))
y_5 = (x_0 \wedge x_1 \wedge x_2 \wedge x_3)
<u>2.2b</u>
ON(f_0) = \{0000\}
ON(f_1) = \{0001, 0010, 0011, 0100, 0101, 0110, 0111, 1000, 1001, 1010, 1011, 1100, 1011, 1010, 1011, 1100, 1011, 1100, 1011, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1101, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100,
1101, 1110, 1111}
ON(f_2) = \{0110, 0111, 1000, 1001, 1010, 1011, 1100, 1101, 1110, 1111\}
ON(f_3) = \{0111, 1000, 1001, 1010, 1011, 1100, 1101, 1110, 1111\}
ON(f_4) = \{1001, 1010, 1011, 1100, 1101, 1110, 1111\}
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 $ON(f_5) = \{1010, 1011, 1100, 1101, 1110, 1111\}$ 

 $ON(f_6) = \{1111\}$ 

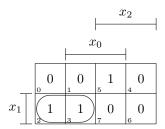
## $\underline{2.2c}$

 $f: \mathbb{B}^4 \to \mathbb{B}^6$ 

Die minimierten Formen entsprechen den bereits beim Ablesen zusammengefassten Werten aus 2.2a.

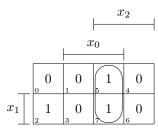
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f(x_3, x_2, x_1, x_0) = (y_5, y_4, y_3, y_2, y_1, y_0) für
y_0 = (x_3 \vee x_2 \vee x_1 \vee x_0)
y_1 = (x_3 \vee (x_2 \wedge x_1))
y_2 = (x_3 \vee (x_2 \wedge x_1 \wedge x_0))
y_3 = (x_3 \land \neg (x_2 \land x_1 \land x_0))
y_4 = ((x_3 \wedge x_2) \vee (x_3 \wedge x_1))
y_5 = (x_0 \wedge x_1 \wedge x_2 \wedge x_3)
   2.3a
f: \mathbb{B}^3 \to \mathbb{B}^3
f(x_2, x_1, x_0) = (y_2, y_1, y_0) für
y_0 = ((\neg x_2 \land x_1 \land \neg x_0) \lor (\neg x_2 \land x_1 \land x_0) \lor (x_2 \land \neg x_1 \land x_0))
y_1 = ((\neg x_2 \land x_1 \land \neg x_0) \lor (x_2 \land \neg x_1 \land x_0) \lor (x_2 \land x_1 \land x_0))
y_2 = ((\neg x_2 \land x_1 \land x_0) \lor (x_2 \land \neg x_1 \land x_0))
   2.3b
ON(f_0) = \{010, 011, 101\}
ON(f_1) = \{010, 101, 111\}
ON(f_2) = \{011, 101\}
DC(f_0) = \{000, 001, 100, 110\}
DC(f_1) = \{000, 001, 100, 110\}
DC(f_2) = \{000, 001, 100, 110\}
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## <u>2.3c</u>



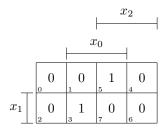
Führt zu:

$$y_0 = ((\neg x_2 \wedge x_1) \vee (x_2 \wedge \neg x_1 \wedge x_0))$$



Führt zu:

$$y_1 = ((x_2 \wedge x_0) \vee (\neg x_2 \wedge x_1 \wedge \neg x_0))$$



Führt weiterhin zu:

$$y_2 = ((\neg x_2 \wedge x_1 \wedge x_0) \vee (x_2 \wedge \neg x_1 \wedge x_0))$$