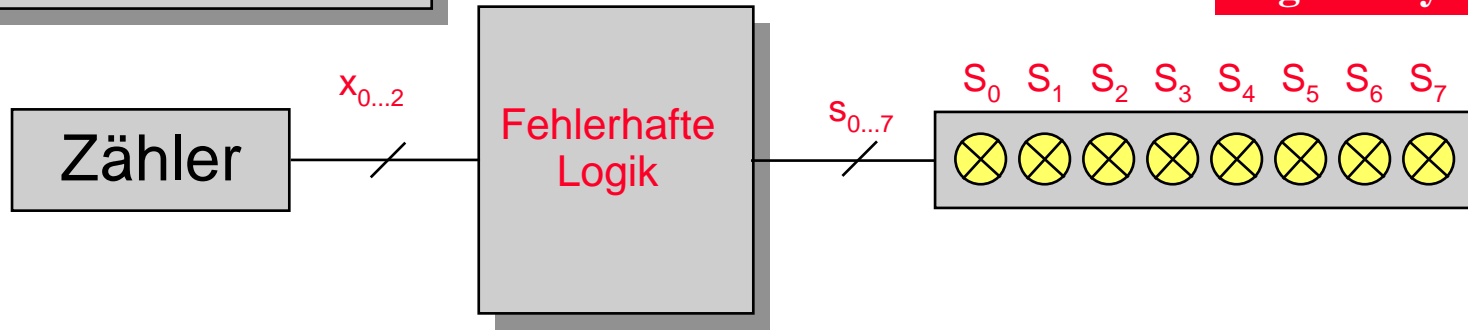


Zählerstand S_0 S_1 S_2 S_3 S_4 S_5 S_6 S_7

X_0	⊗	●	●	●	●	●	●	⊗
X_1	⊗	⊗	●	●	●	●	⊗	⊗
X_2	⊗	⊗	⊗	●	●	⊗	⊗	⊗
X_3	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
X_4	●	⊗	⊗	⊗	⊗	⊗	⊗	●
X_5	●	●	⊗	⊗	⊗	⊗	●	●
X_6	●	●	●	⊗	⊗	●	●	●
X_7	●	●	●	●	●	●	●	●

Fehlerhafte Schaltung

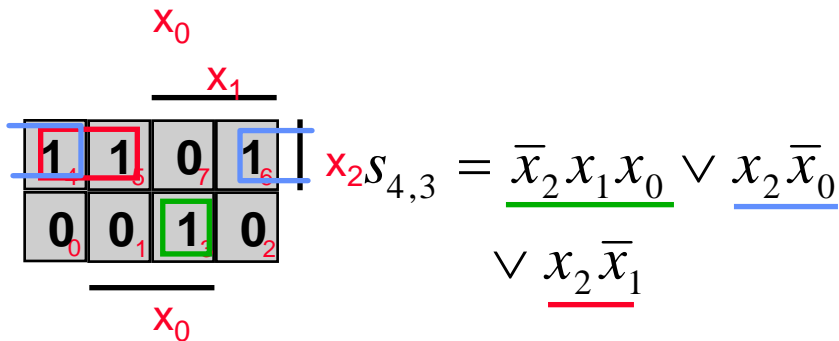
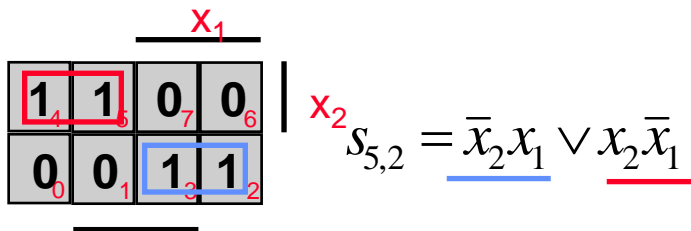
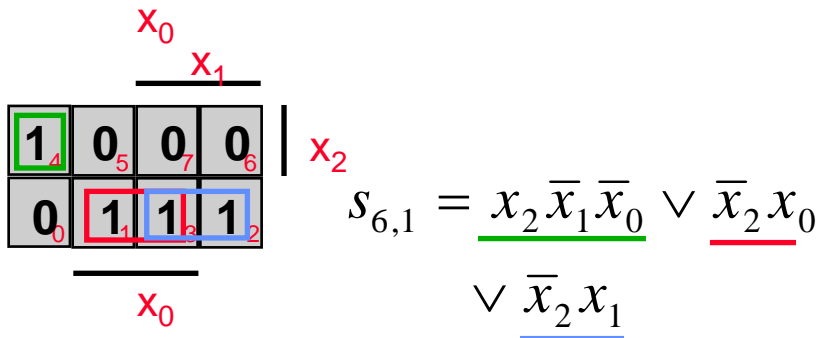
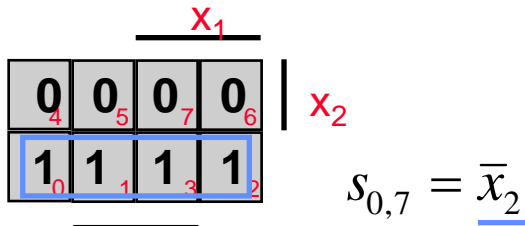
Digitale Systeme



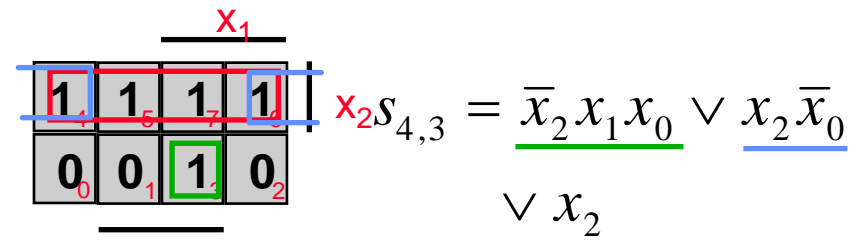
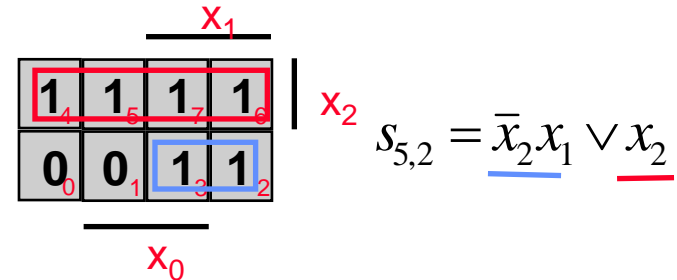
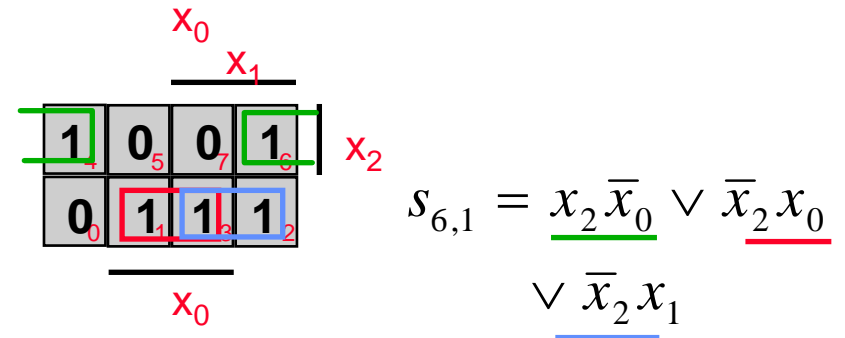
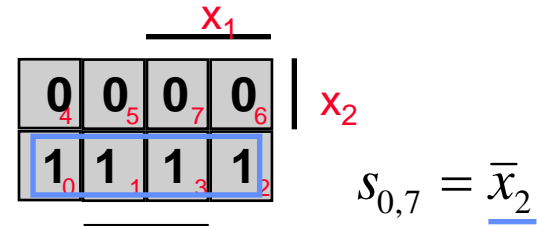
Zählerstand S_0 S_1 S_2 S_3 S_4 S_5 S_6 S_7

X_0	⊗	●	●	●	●	●	●	⊗
X_1	⊗	⊗	●	●	●	●	⊗	⊗
X_2	⊗	⊗	⊗	●	●	⊗	⊗	⊗
X_3	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
X_4	●	⊗	⊗	⊗	⊗	⊗	⊗	●
X_5	●	●	⊗	⊗	⊗	⊗	●	●
X_6	●	⊗	⊗	⊗	⊗	⊗	⊗	●
X_7	●	●	⊗	⊗	⊗	⊗	●	●

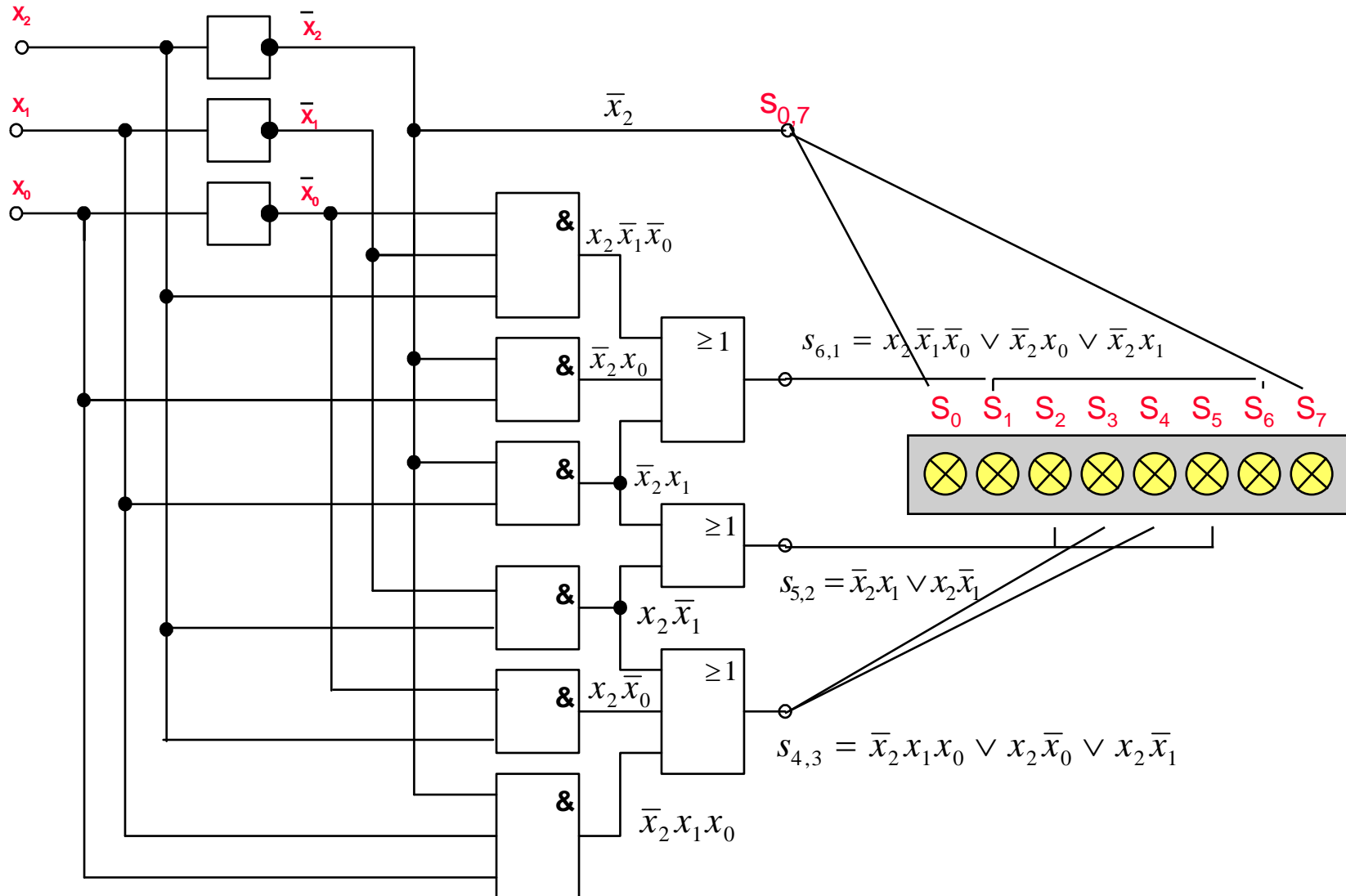
Soll



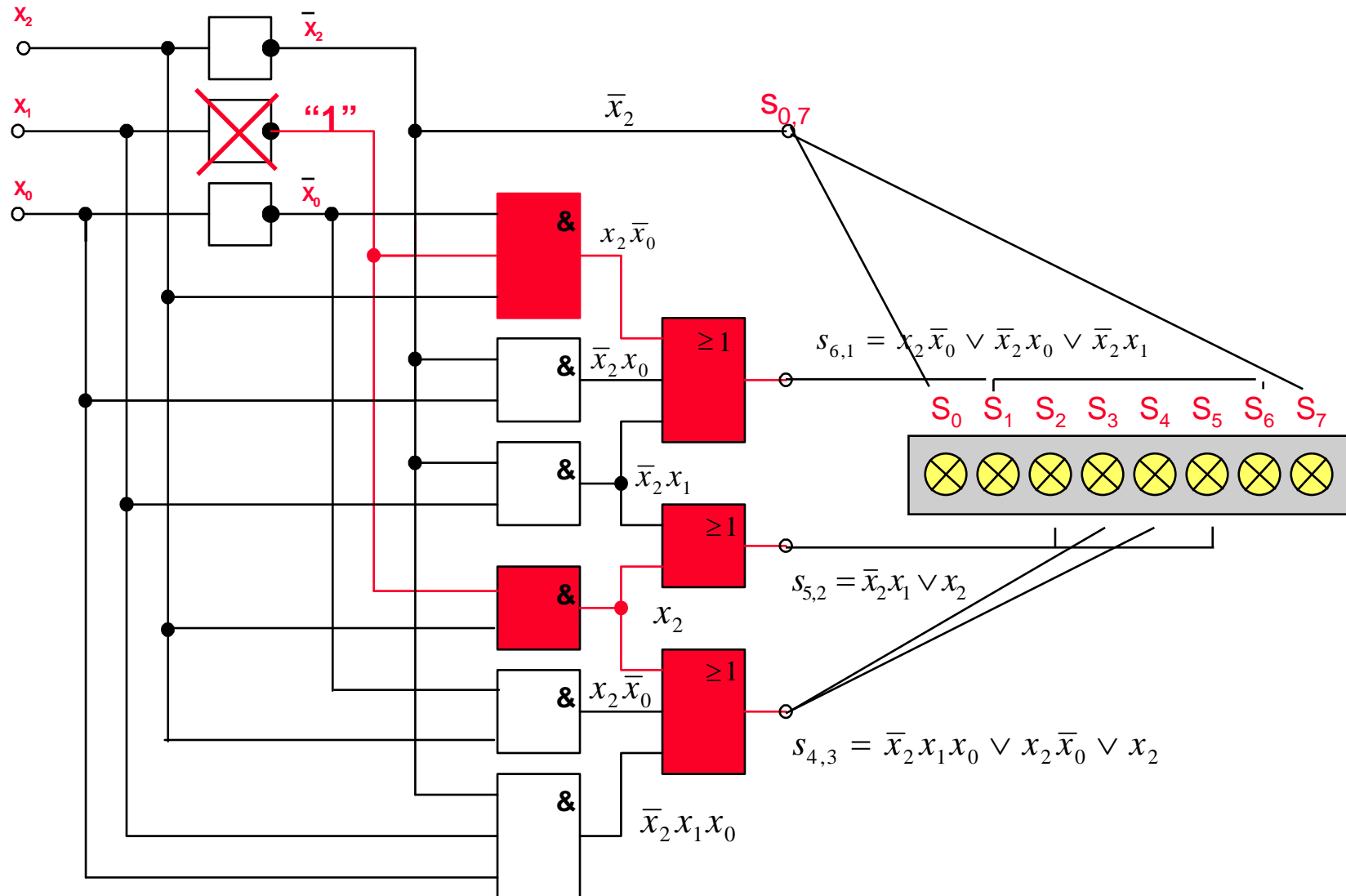
Ist

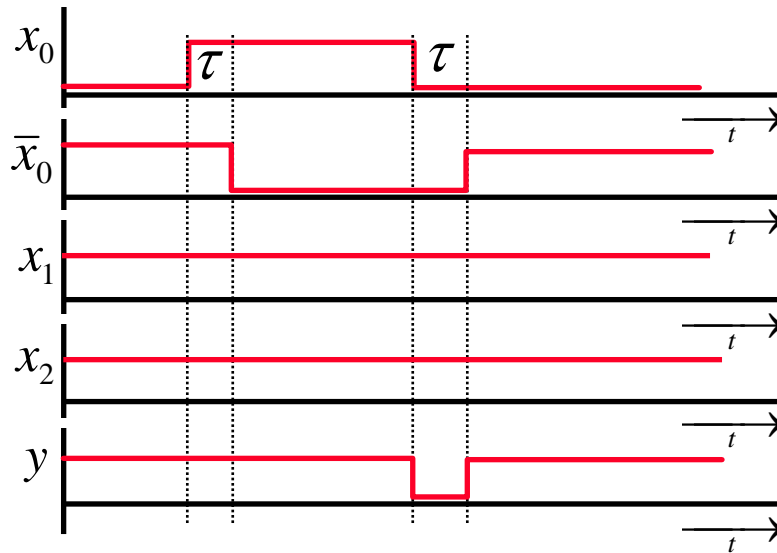
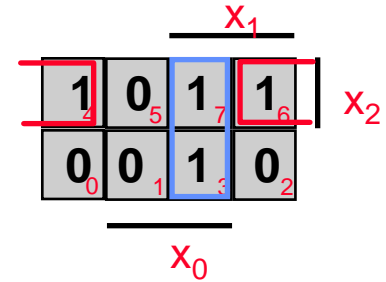
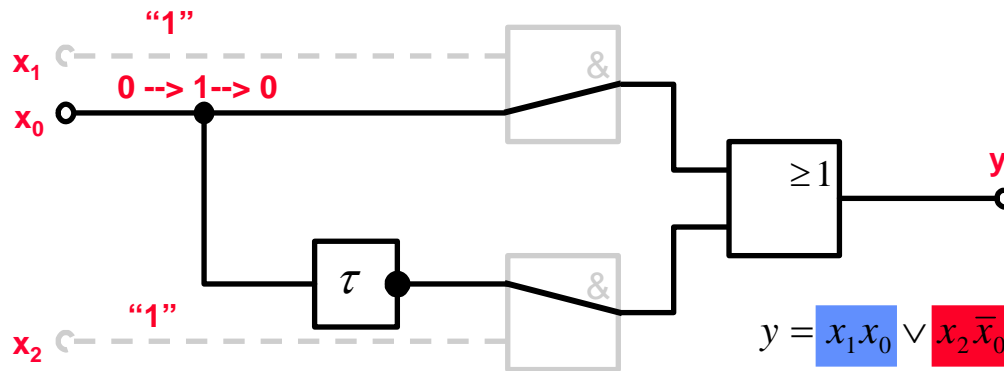


Soll



Ist



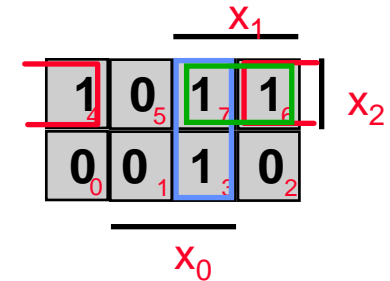
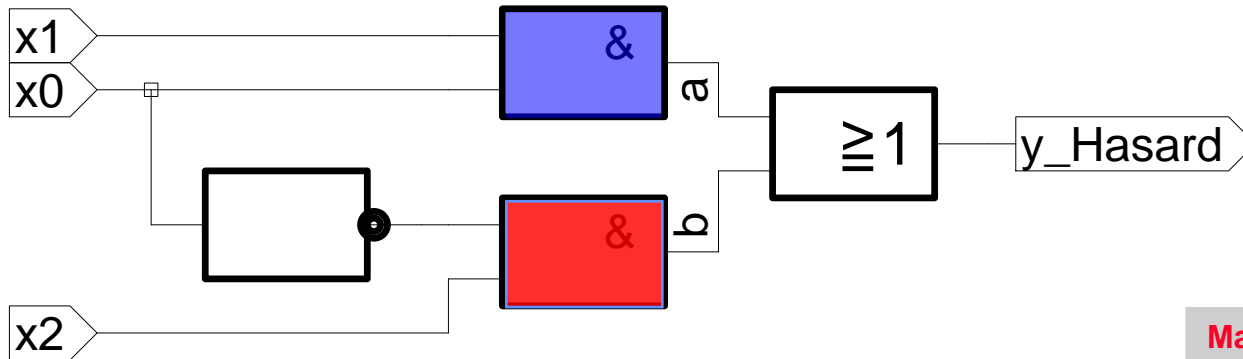


1 - Hazard

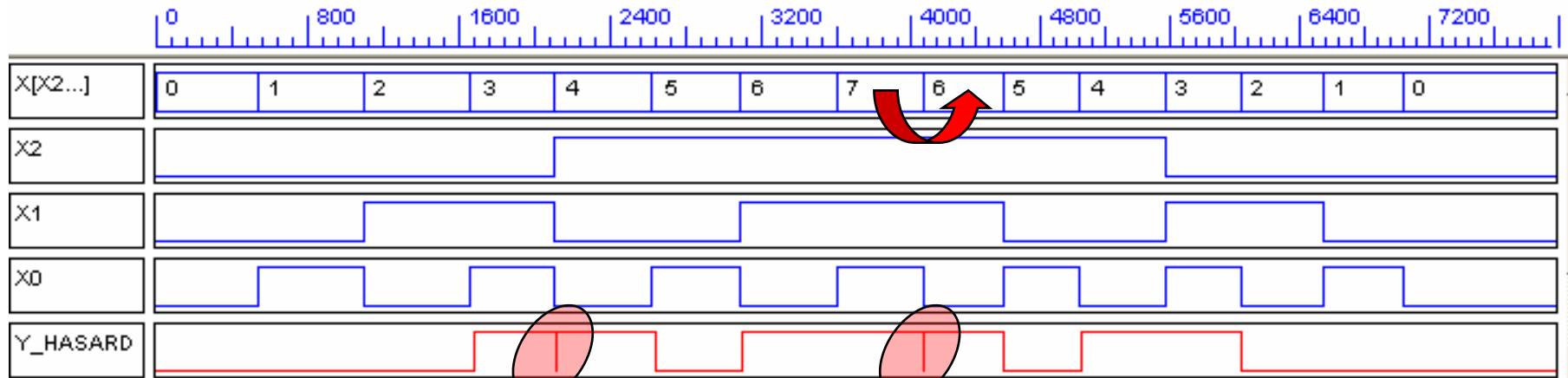
Statische Hasards entstehen in disjunktiven Normalformen an den Rückflanken der hasardverursachenden Variablen.
Die hasardverursachende Variable erkennt man an benachbarten Blöcken im Karnaughplan.

$$y = x_1 x_0 \vee x_2 \bar{x}_0$$

$$y = a \vee b$$

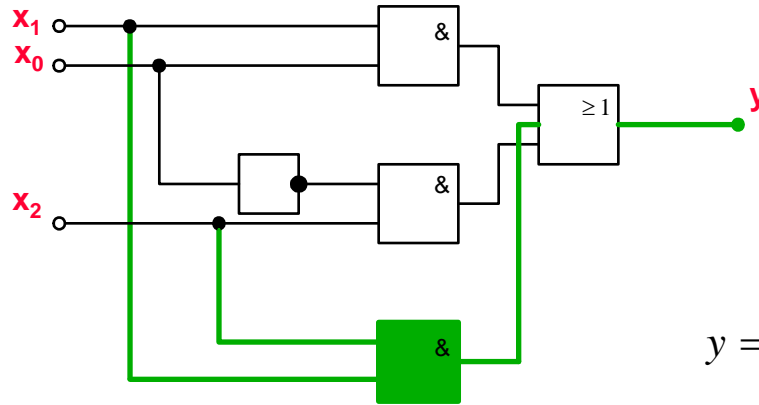


Man beseitigt den statischen Hasard durch Hinzufügen desjenigen Terms, der die benachbarten Blockgrenzen überdeckt.

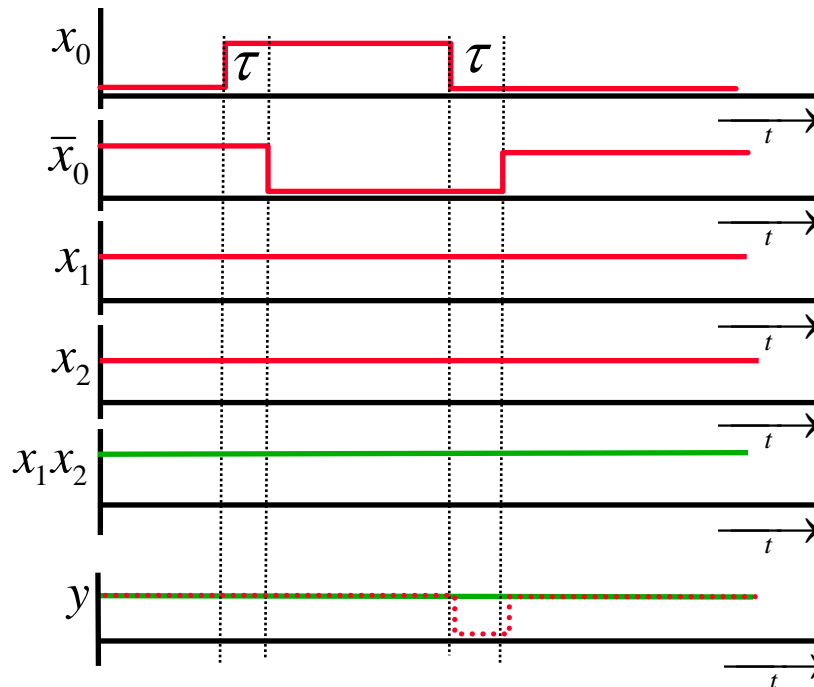
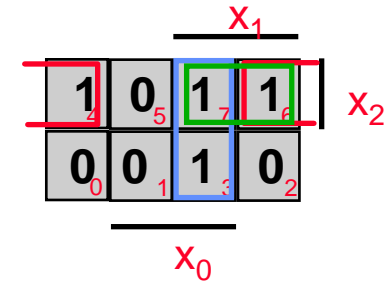


dynamischer Hasard

statischer Hasard



$$y = x_1 x_0 \vee x_2 \bar{x}_0 \vee x_2 x_1$$

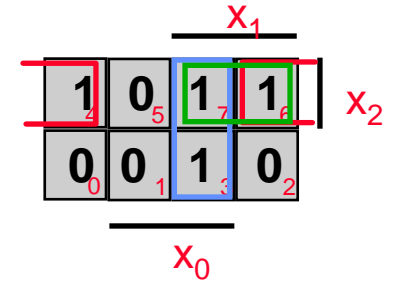
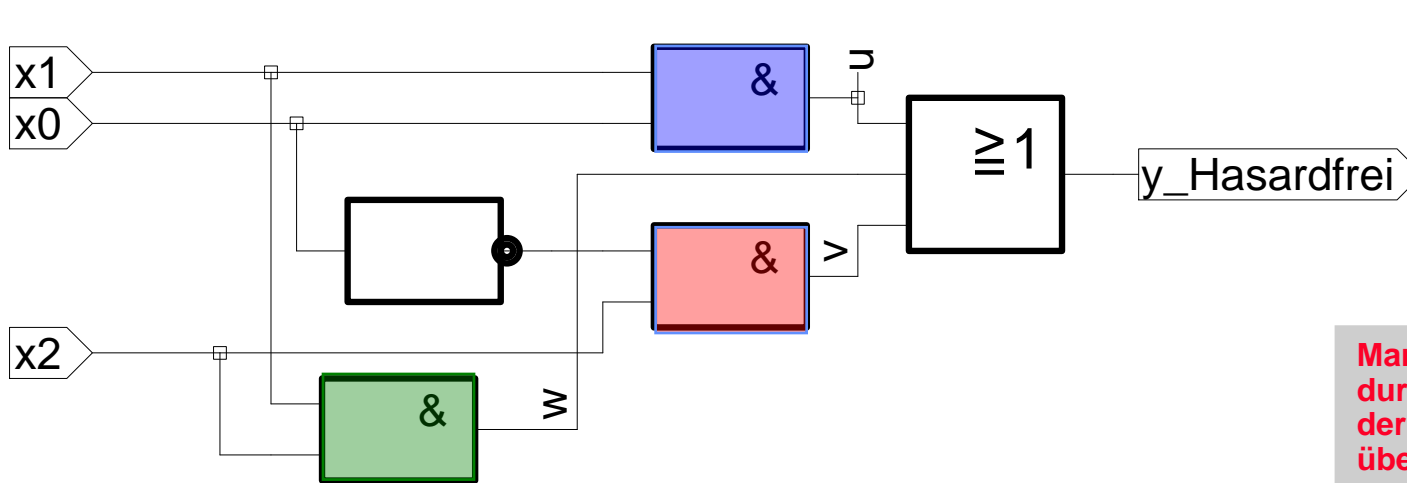


Man beseitigt den statischen Hasard durch Hinzufügen desjenigen Terms, der die benachbarten Blockgrenzen überdeckt.

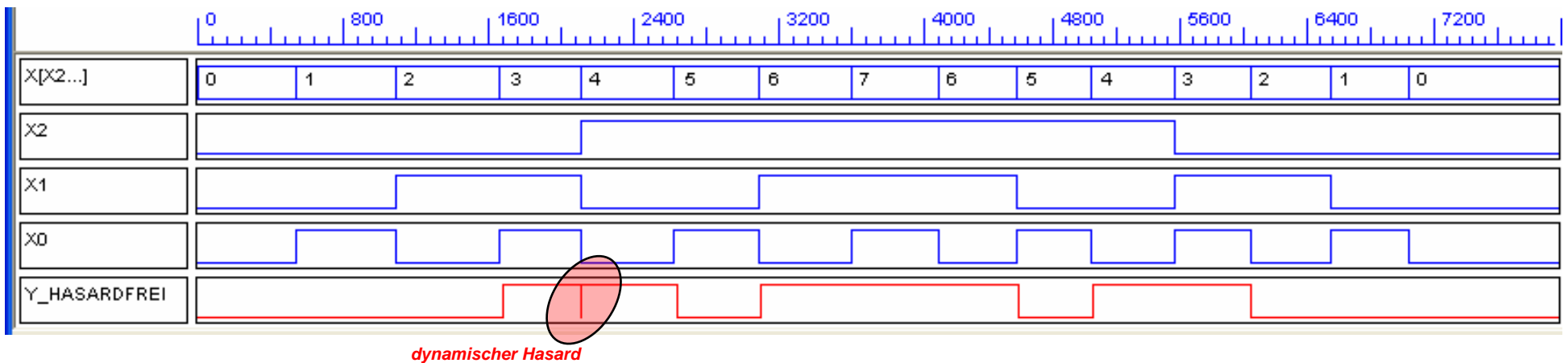
Beseitigung statischer Hasards

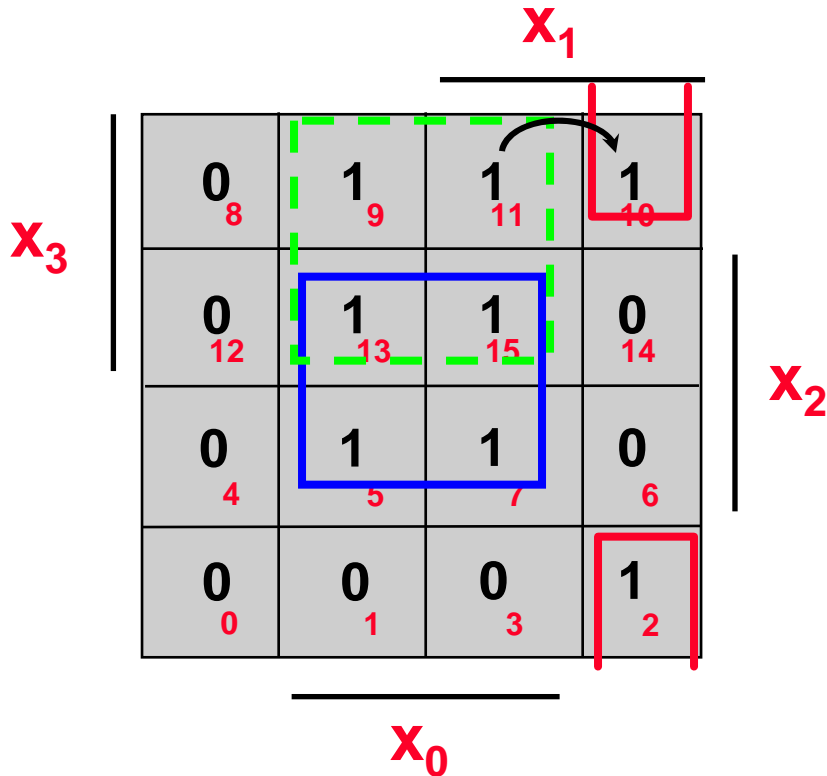
$$y = x_1x_0 \vee x_2\bar{x}_0 \vee x_2x_1$$

$$y = u \vee v \vee w$$

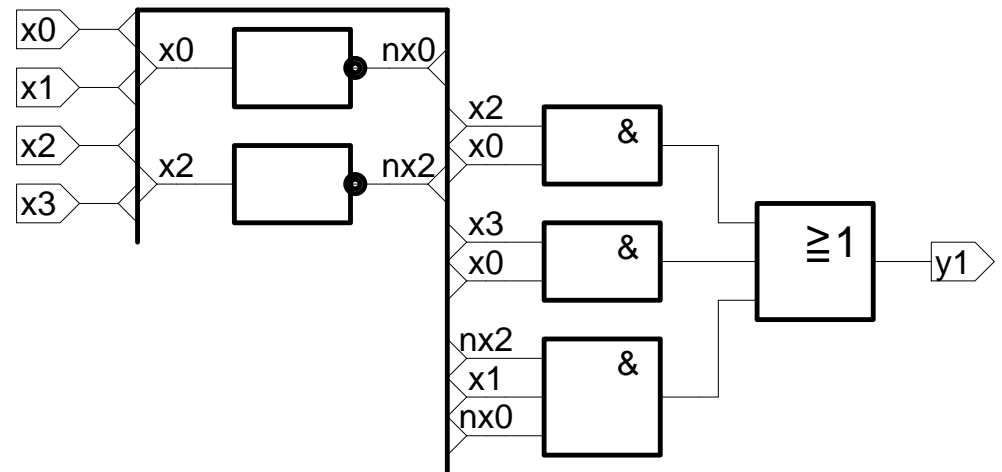


Man beseitigt den statischen Hasard durch Hinzufügen desjenigen Terms, der die benachbarten Blockgrenzen überdeckt.



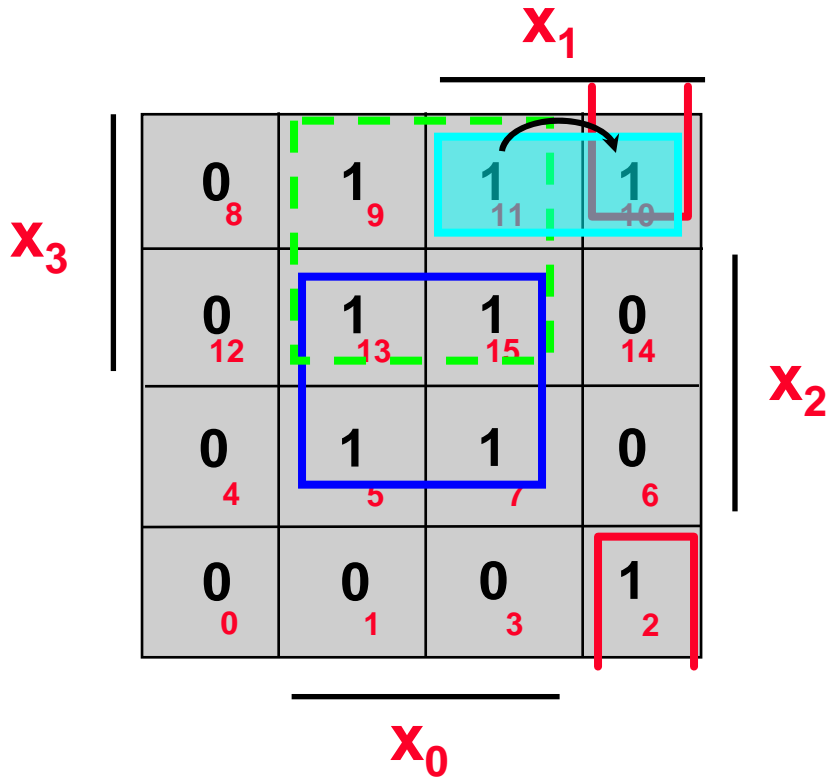


$$y_{-1} = x_2 x_0 \vee x_3 x_0 \vee \bar{x}_2 x_1 \bar{x}_0$$

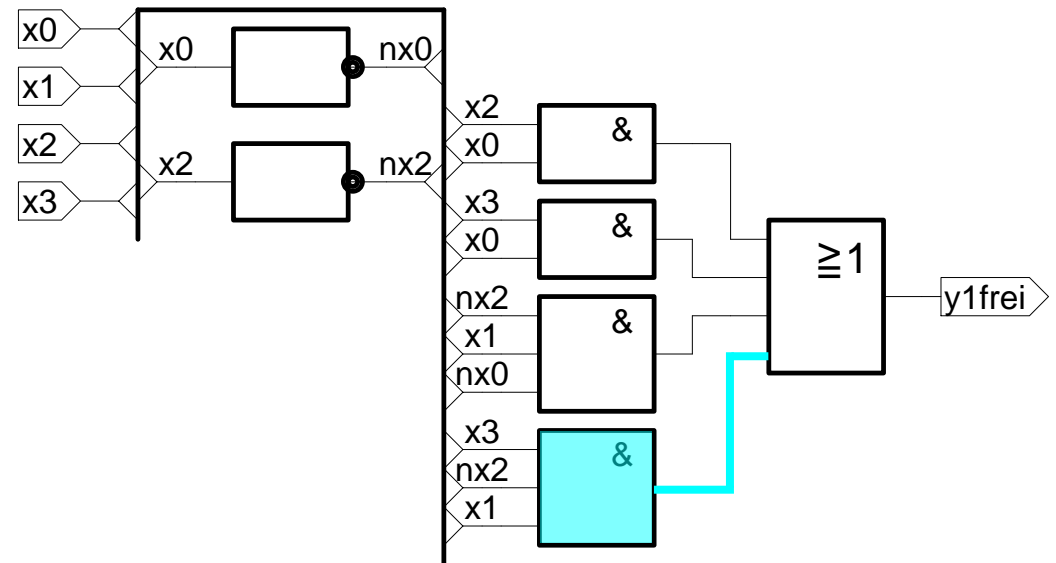


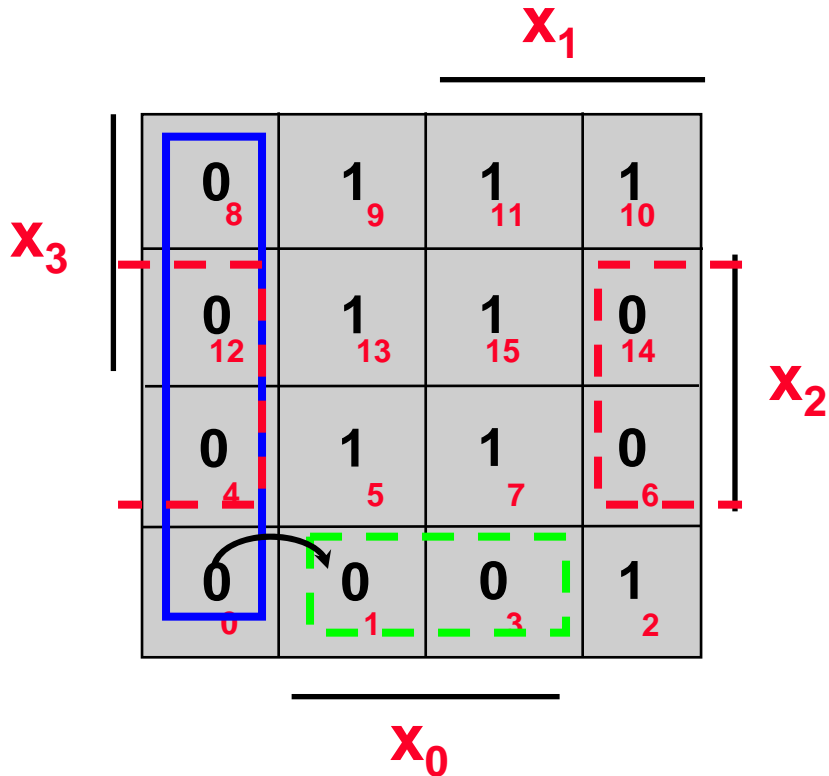
Achtung!

Der Übergang von x_{11} nach x_{10} entsteht durch eine Rückflanke an x_0 !



$$y_{-1-frei} = x_2 x_0 \vee x_3 x_0 \vee \bar{x}_2 x_1 \bar{x}_0 \vee x_3 \bar{x}_2 x_1$$





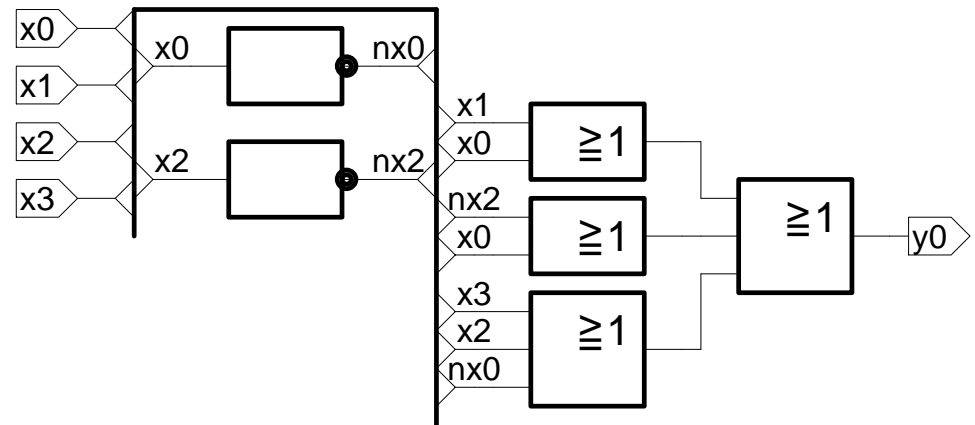
Achtung!

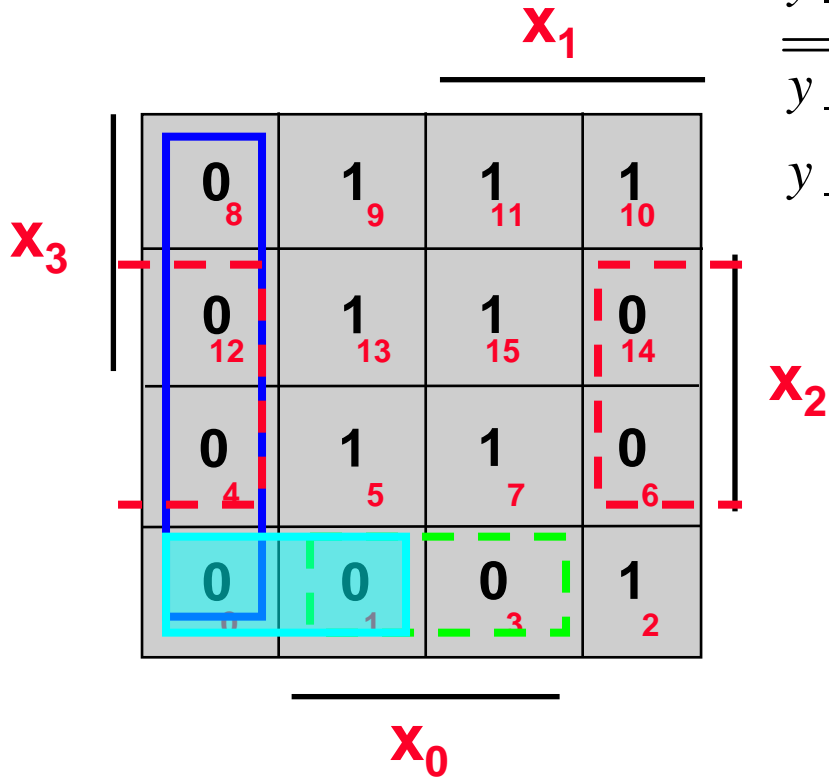
Der Übergang von x_0 nach x_1 entsteht durch eine Vorderflanke an x_0 !

$$\overline{y}_{-0} = \overline{x_1} \overline{x_0} \vee x_2 \overline{x_0} \vee \overline{x_3} \overline{x_2} x_0$$

$$\overline{\overline{y}_{-0}} = \overline{\overline{x_1} \overline{x_0} \vee x_2 \overline{x_0} \vee \overline{x_3} \overline{x_2} x_0}$$

$$y_{-0} = (x_1 \vee x_0)(\overline{x_2} \vee x_0)(x_3 \vee x_2 \vee \overline{x_0})$$





$$\overline{y_{-0-}}_{frei} = \overline{x_1 \overline{x_0}} \vee \overline{x_2 \overline{x_0}} \vee \overline{x_3 \overline{x_2} x_0} \vee \overline{x_3 \overline{x_2} \overline{x_1}}$$

$$\overline{y_{-0-}}_{frei} = \overline{x_1 \overline{x_0}} \vee \overline{x_2 \overline{x_0}} \vee \overline{x_3 \overline{x_2} x_0} \vee \overline{x_3 \overline{x_2} \overline{x_1}}$$

$$\overline{y_{-0-}}_{frei} = (x_1 \vee x_0)(\overline{x_2} \vee x_0)(x_3 \vee x_2 \vee \overline{x_0})(x_3 \vee x_2 \vee x_1)$$

