calc_logic_example

Student Group

First Name	Surname	Matrikel Nr.

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example for a simplification with the rule for boolean algebra

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At first we will switch the representation to the following:

\begin{align*} \begin{array}{ll} \overline{a \lor (b \land (\bar{a} \lor c) \land 1) \lor a} & \color{white}{\overline{ab}} \\ \quad\quad\quad\quad\quad\quad & \quad\quad\quad\quad\quad\quad \\ \end{array} \end{align*}

At first we will switch the representation to the following:

\begin{align*} \begin{array}{ll} /(a + (b \cdot (/a + c) \cdot 1) + a) & \color{white}{\overline{ab}} \\ \quad\quad\quad\quad\quad\quad & \quad\quad\quad\quad\quad\quad \\ \end{array} \end{align*}

1. $\color{blue}{\text{Neutral Element}}$

\begin{align*} \begin{array}{ll} /(a + (b \cdot (/a + c) \color{blue}{\cdot 1}) + a) & \color{white}{\overline{ab}} \\ \quad\quad\quad\quad\quad\quad & \quad\quad\quad\quad\quad\quad \\ \end{array} \end{align*}

1. $\color{blue}{\text{Neutral Element}}$

\begin{align*} \begin{array}{ll} /(a + (b \cdot (/a + c) \quad) + a) & \color{white}{\overline{ab}} \\ \quad\quad\quad\quad\quad\quad & \quad\quad\quad\quad\quad\quad \\ \end{array} \end{align*}

2. $\color{blue}{\text{Commutative Law}}$

\begin{align*} \begin{array}{ll} /(a + \color{blue}{(b \cdot (/a + c) \quad) + a }) & \color{white}{\overline{ab}} \\ \quad\quad\quad\quad\quad\quad & \quad\quad\quad\quad\quad\quad \\ \end{array} \end{align*}

2. $\color{blue}{\text{Commutative Law}}$

\begin{align*} \begin{array}{ll} /(a + a + (b \cdot (/a + c))) & \color{white}{\overline{ab}} \\ \quad\quad\quad\quad\quad\quad & \quad\quad\quad\quad\quad\quad \\ \end{array} \end{align*}

3. $\color{blue}{\text{Idempotence}}$

\begin{align*} \begin{array}{ll} /(\color{blue}{a + a} + (b \cdot (/a + c))) &

\color{white}{\overline{ab}} \\ \quad\quad\quad\quad\quad\quad & \quad\quad\quad\quad\quad\quad \\ \end{array} \end{align*}

3. $\color{blue}{\text{Idempotence}}$

\begin{align*} \begin{array}{ll} /(a \quad + (b \cdot (/a + c))) & \color{white}{\overline{ab}} \\ \quad\quad\quad\quad\quad\quad & \quad\quad\quad\quad\quad\quad \\ \end{array} \end{align*}

4. $\color{blue}{\text{Distributive Law}}$

\begin{align*} \begin{array}{ll} /(a \quad + (\color{blue}{b \cdot (/a + c)})) & \color{white}{\overline{ab}} \\ \quad\quad\quad\quad\quad\quad & \quad\quad\quad\quad\quad\quad \\ \end{array} \end{align*}

4. $\color{blue}{\text{Distributive Law}}$

\begin{align*} \begin{array}{ll} /(a \quad + ((b \cdot /a) + (b \cdot c)))) & \color{white}{\overline{ab}} \\ \quad\quad\quad\quad\quad\quad & \quad\quad\quad\quad\quad\quad \\ \end{array} \end{align*}

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