

calc_logic_example

Student Group

First Name	Surname	Matrikel Nr.

Table of Contents

example for a simplification with the rule for boolean algebra

$$\overline{a \vee (b \wedge (\bar{a} \vee c) \wedge 1) \vee a} \quad \& \quad \quad \& \quad \quad \quad \end{array} \end{align*}$$

example for a simplification with the rule for boolean algebra

$$\overline{a \vee (b \wedge (\bar{a} \vee c) \wedge 1) \vee a} \quad \& \quad \quad \quad \& \quad \quad \quad$$

example for a simplification with the rule for boolean algebra

[illegible]

example for a simplification with the rule for boolean algebra

$$\begin{array}{ll} \overline{a \vee (b \wedge (\bar{a} \vee c) \wedge 1) \vee a} & \\ \quad\quad\quad\quad\quad\quad\quad\quad\quad\quad & \quad\quad\quad\quad\quad\quad\quad\quad\quad\quad \end{array}$$

example for a simplification with the rule for boolean algebra

$$\begin{array}{ll} \overline{a \vee (b \wedge (\bar{a} \vee c) \wedge 1) \vee a} & \\ \quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad & \quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad \end{array}$$

example for a simplification with the rule for boolean algebra

$$\begin{array}{ll} \overline{a \vee (b \wedge (\bar{a} \vee c) \wedge 1)} \vee a & \\ \quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad& \end{array}$$

example for a simplification with the rule for boolean algebra

$$\begin{array}{ll} \overline{a \vee (b \wedge (\bar{a} \vee c) \wedge 1)} \vee a & \\ \quad\quad\quad\quad\quad\quad\quad\quad & \\ & \end{array}$$

example for a simplification with the rule for boolean algebra

$$\begin{array}{ll} \overline{a \vee (b \wedge (\bar{a} \vee c) \wedge 1)} \vee a & \\ \quad\quad\quad\quad\quad\quad& \end{array}$$

example for a simplification with the rule for boolean algebra

$$\overline{a \vee (b \wedge (\bar{a} \vee c) \wedge 1) \vee a} \quad \& \quad \quad \& \quad \quad \quad \end{array} \end{align*}$$

example for a simplification with the rule for boolean algebra

$$\overline{a \vee (b \wedge (\bar{a} \vee c) \wedge 1) \vee a} \quad \& \quad \quad \quad \& \quad \quad \quad$$

example for a simplification with the rule for boolean algebra

$$\begin{array}{ll} \overline{a \vee (b \wedge (\bar{a} \vee c) \wedge 1) \vee a} & \\ \quad\quad\quad\quad\quad\quad\quad\quad & \end{array}$$

example for a simplification with the rule for boolean algebra

[illegible]

example for a simplification with the rule for boolean algebra

[illegible]

example for a simplification with the rule for boolean algebra

$$\begin{array}{ll} \overline{a \vee (b \wedge (\bar{a} \vee c) \wedge 1) \vee a} & \\ \quad\quad\quad\quad\quad\quad\quad\quad\quad & \end{array}$$

example for a simplification with the rule for boolean algebra

$$\begin{array}{ll} \overline{a \vee (b \wedge \bar{a} \vee c) \wedge 1} \vee a & \\ \quad \quad \quad \& \quad \quad \quad \end{array}$$

example for a simplification with the rule for boolean algebra

$$\begin{array}{ll} \overline{(a \vee (b \wedge (\bar{a} \vee c) \wedge 1)) \vee a} & \\ \quad\quad\quad\quad\quad\quad\quad\quad\quad\quad & \end{array}$$

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 & \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 & \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 & \end{array} \end{align*}
```

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

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

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

$$\begin{array}{l} \textcolor{blue}{a + a} + (b \cdot (a + c)) \quad \& \\ \overline{ab} \quad \& \\ \quad \end{array}$$

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

$$\begin{array}{l} (a \quad \& + (b \cdot (a + c)) \quad \&) \quad \& \\ \overline{ab} \quad \& \\ \quad \end{array}$$

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

$$\begin{array}{l} (a \quad \& + (\textcolor{blue}{b \cdot (a + c)} \quad \&) \quad \&) \quad \& \\ \overline{ab} \quad \& \\ \quad \end{array}$$

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

$$\begin{array}{l} (a \quad \& + ((b \cdot a) + (b \cdot c))) \quad \& \\ \overline{ab} \quad \& \\ \quad \end{array}$$

5. $\textcolor{blue}{\text{Associative Law}}$

$$\begin{array}{l} (\textcolor{blue}{a \quad \& + ((b \cdot a) + (b \cdot c))}) \quad \& \\ \overline{ab} \quad \& \\ \quad \end{array}$$

5. $\textcolor{blue}{\text{Associative Law}}$

$$\begin{array}{l} (a \quad \& + ((b \cdot a) + (b \cdot c))) \quad \& \\ \overline{ab} \quad \& \\ \quad \end{array}$$

6. $\textcolor{blue}{\text{Absorption Law}}$

$$\begin{array}{l} \textcolor{blue}{a \quad \backslash, + \backslash, (b \cdot a)} + (b \cdot c) \backslash,) \& \\ \textcolor{white}{\overline{ab}} \quad \quad \quad \& \\ \quad \quad \quad \end{array}$$

6. $\textcolor{blue}{\text{Absorption Law}}$

$$\begin{array}{l} (a \quad \backslash, + \backslash, \backslash, b \quad + (b \cdot c) \backslash,) \& \\ \textcolor{white}{\overline{ab}} \quad \quad \quad \& \\ \quad \quad \quad \end{array}$$

7. $\textcolor{blue}{\text{Absorption Law}}$

$$\begin{array}{l} (a \enspace \backslash: + \backslash, \textcolor{blue}{b \quad + \backslash, (b \cdot c) \backslash,) \& \\ \textcolor{white}{\overline{ab}} \quad \quad \quad \& \\ \quad \quad \quad \end{array}$$

From:

<https://mexle.te.hs-heilbronn.de/> - **MEXLE Wiki**

Permanent link:

https://mexle.te.hs-heilbronn.de/introduction_to_digital_systems/calc_logic_example?rev=1631829691

Last update: **2021/09/17 00:01**

