

calc_decimal_example

Student Group

First Name	Surname	Matrikel Nr.

Table of Contents

\$I.\quad\$ Calculation example for decimal value

Idea: The number \$2658.47\$ is only the representation with the numerals \$[0..9]\$, but what is the value behind it?

```
\begin{align*} \begin{smallmatrix} \color{black}{\text{number}:} & \color{black}{} & \\ \color{black}{2} & \color{black}{6} & \color{black}{5} & \color{black}{8.} & \color{black}{4} & \\ \color{black}{7} & \color{white}{\text{index}:} & \color{white}{i} & \color{white}{3} & & \\ \color{white}{2} & \color{white}{1} & \color{white}{0} & \color{white}{-1} & \color{white}{-2} & \\ \color{white}{\text{place value}:} & \color{white}{B^i} & \color{white}{10^3} & & & \\ \color{white}{10^2} & \color{white}{10^1} & \color{white}{10^0} & \color{white}{10^{-1}} & & \\ \color{white}{10^{-2}} & \color{white}{} & \color{white}{} & \color{white}{1000} & & \\ \color{white}{100} & \color{white}{10} & \color{white}{1} & \color{white}{0.1} & & \\ \color{white}{0.01} & \color{white}{\text{numerals}:} & \color{white}{z_i} & \color{white}{2} & & \\ \color{white}{6} & \color{white}{5} & \color{white}{8} & \color{white}{4} & \color{white}{7} & \\ \color{white}{\text{calc}.:} & \color{white}{z_i \cdot B^i} & \color{white}{2000} & & & \\ \color{white}{600} & \color{white}{50} & \color{white}{8} & \color{white}{0.4} & & \\ \color{white}{0.07} & \color{white}{\text{result}:} & \color{white}{\sum_i z_i \cdot B^i} & & & \\ \color{white}{2658.47} & & & & & \end{smallmatrix} \end{align*}
```

```
\begin{align*} \begin{smallmatrix} \color{black}{\text{number}:} & \color{black}{} & \\ \color{black}{2} & \color{black}{6} & \color{black}{5} & \color{black}{8.} & \color{black}{4} & \\ \color{black}{7} & \color{blue}{\text{index}:} & \color{blue}{i} & \color{blue}{3} & \color{blue}{2} & \\ \color{blue}{2} & \color{blue}{1} & \color{blue}{0} & \color{blue}{-1} & \color{blue}{-2} & \\ \color{white}{\text{place value}:} & \color{white}{B^i} & \color{white}{10^3} & & & \\ \color{white}{10^2} & \color{white}{10^1} & \color{white}{10^0} & \color{white}{10^{-1}} & & \\ \color{white}{10^{-2}} & \color{white}{} & \color{white}{} & \color{white}{1000} & & \\ \color{white}{100} & \color{white}{10} & \color{white}{1} & \color{white}{0.1} & & \\ \color{white}{0.01} & \color{white}{\text{numerals}:} & \color{white}{z_i} & \color{white}{2} & & \\ \color{white}{6} & \color{white}{5} & \color{white}{8} & \color{white}{4} & \color{white}{7} & \\ \color{white}{\text{calc}.:} & \color{white}{z_i \cdot B^i} & \color{white}{2000} & & & \\ \color{white}{600} & \color{white}{50} & \color{white}{8} & \color{white}{0.4} & & \\ \color{white}{0.07} & \color{white}{\text{result}:} & \color{white}{\sum_i z_i \cdot B^i} & & & \\ \color{white}{2658.47} & & & & & \end{smallmatrix} \end{align*}
```

```
\begin{align*} \begin{smallmatrix} \color{black}{\text{number}:} & \color{black}{} & \\ \color{black}{2} & \color{black}{6} & \color{black}{5} & \color{black}{8.} & \color{black}{4} & \\ \color{black}{7} & \color{black}{\text{index}:} & \color{black}{i} & \color{black}{3} & & \\ \color{black}{2} & \color{black}{1} & \color{black}{0} & \color{black}{-1} & \color{black}{-2} & \\ \color{blue}{\text{place value}:} & \color{blue}{B^i} & \color{blue}{10^3} & \color{blue}{10^2} & \color{blue}{10^1} & \\ \color{blue}{10^0} & \color{blue}{10^{-1}} & \color{blue}{10^{-2}} & \color{white}{} & \color{white}{} & \\ \color{white}{1000} & \color{white}{100} & \color{white}{10} & \color{white}{1} & \color{white}{0.1} & \\ \color{white}{0.01} & \color{white}{\text{numerals}:} & \color{white}{z_i} & \color{white}{2} & \color{white}{6} & \\ \color{white}{5} & \color{white}{8} & \color{white}{4} & \color{white}{7} & & \\ \color{white}{\text{calc}.:} & \color{white}{z_i \cdot B^i} & \color{white}{2000} & & & \\ \color{white}{600} & \color{white}{50} & \color{white}{8} & \color{white}{0.4} & & \\ \color{white}{0.07} & \color{white}{\text{result}:} & \color{white}{\sum_i z_i \cdot B^i} & & & \end{smallmatrix} \end{align*}
```


value		2	6	5	8 ,	4		7
index	\$i\$	3	2	1	0	-1		-2
place value	B^i	$\$\\small{10^3}$$	$\$\\small{10^2}$$	$\$\\small{10^1}$$	$\$\\small{10^0}$$	$\$\\small{10^{-1}}$$		$\$\\small{10^{-2}}$$
		$\$\\small{1000}$$	$\$\\small{100}$$	$\$\\small{10}$$	$\$\\small{1}$$	$\$\\small{0.10}$$		$\$\\small{0.01}$$
digit	z_i	2	6	5	8	4		7
calc.	$z_i \cdot B^i$	2000	600	50	8	0.4		0.07

Result	
$\sum_i z_i \cdot B^i$	2658,47

[illegible]

\$II.\quad\$ Betrachtung der Spannungsverstärkung

[illegible]

From:

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

Permanent link:

[https://wiki.mexle.te.hs-heilbronn.de/introduction to digital systems/calc decimal example?rev=1631666880](https://wiki.mexle.te.hs-heilbronn.de/introduction%20to%20digital%20systems/calc%20decimal%20example?rev=1631666880)

Last update: **2021/09/15 02:48**

