Convert a length into one with another unit 
with Lua\TeX

Herbert Voß

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Contents

1 Using ............................................ 1
2 Macros ........................................... 1
3 The units ........................................... 2
4 Examples .......................................... 2
   4.1 Converting a \TeX length ......................... 2
   4.2 Converting a value with given unit into another one ...... 5

1 Using

\usepackage{unitconv}

2 Macros

\convTeXLength*[<unit>]<digits>{<TeX length}>
\convLength*[<unit>]<digits>{<value>}[<unit>]

The star version prints the number in scientific notation. The default setting for
the unit is cm and for the number of digits -1 (print all digits). The dynamic
units em, ex, and mu depend on the current fontsize.

• This package works only with lualatex!
• With AmsMath you have to load the package before unitconv.
3 The units

<table>
<thead>
<tr>
<th>Short</th>
<th>Long</th>
</tr>
</thead>
<tbody>
<tr>
<td>bp</td>
<td>Big Point (72 bp/in)</td>
</tr>
<tr>
<td>cc</td>
<td>Cicero (1 cc=12 dd)</td>
</tr>
<tr>
<td>cm</td>
<td>Centimeter</td>
</tr>
<tr>
<td>dd</td>
<td>Didôt (1157 dd = 1238 pt)</td>
</tr>
<tr>
<td>em</td>
<td>Width of »M« in the current font</td>
</tr>
<tr>
<td>ex</td>
<td>Height of »x« in the current font</td>
</tr>
<tr>
<td>in</td>
<td>Inch (72.27 pt)</td>
</tr>
<tr>
<td>km</td>
<td>Kilometer</td>
</tr>
<tr>
<td>m</td>
<td>Meter</td>
</tr>
<tr>
<td>mm</td>
<td>Millimeter</td>
</tr>
<tr>
<td>mu</td>
<td>Math unit (1 mu=(1/18)em)</td>
</tr>
<tr>
<td>pc</td>
<td>Pica (12 pt/pc)</td>
</tr>
<tr>
<td>pt</td>
<td>(T(\hbox{\TeX}))-Points ((1/72.27) Inch)</td>
</tr>
<tr>
<td>px</td>
<td>Pixel, 1 px=(1/72)in (pdf T(\hbox{\TeX}))</td>
</tr>
<tr>
<td>sp</td>
<td>Scaled Point (65536 sp/pt)</td>
</tr>
</tbody>
</table>

4 Examples

4.1 Converting a T\(\hbox{\TeX}\) length

The current example linewidth is 202.32779pt, which is
7.1110125070556 cm
201.57390360053 bp
15.757493321703 cc
189.09139252336 dd
18.477423744292 em
43.070826131013 ex
2.799609682261 in
7.1110125070556e-05 km
0.071110125070556 m
71.110474965381 mm
332.5936279726 mu
16.860649166667 px
202.32779 pt
201.57390360053 px
4.046556e+06 sp
The current character width of M is 1 em, which is
0.38484869998461 cm
10.9019959352 bp
0.85279709659582 cc
10.23644859813 dd
1.0 em
2.3309973688468 ex
0.15151515151515 in
3.8484869998461e-06 km
0.0038484869998461 m
3.8485059361886 mm
18.0 mu
0.9125 pc
10.95 pt
10.9019959352 px
2.190000e+05 sp

The current example linewidth is 202.32779pt, which is
201.574 bp
15.757 cc
7.111 cm
189.091 dd
18.477 em
43.071 ex
2.800 in
0.000 km
0.071 m
71.110 mm
332.594 mu
16.861 pc
202.328 pt
201.574 px
4.046556e+06 sp
The current width of the letter M is 1 em, which is
10.909 bp
0.853 cc
0.385 cm
10.234 dd
1.000 em
2.331 ex
0.152 in
0.000 km
0.004 m
3.849 mm
18.000 mu
0.912 pc
10.950 pt
10.909 px
2.190000e+05 sp

The current example linewidth is 202.32779pt, which is
201.57390360053 bp
16 cc
7.1 cm
189.09 dd
18.477 em
43.0708 ex
2.79961 in
0.000071 km
0.0711101 m
71.11047497 mm
332.593627397 mu
16.806491667 pc
202.3277900000 pt
201.573903600534 px
4.046556e+06 sp

\convTeXLength[bp][3]{1em} \\3
\convTeXLength[cc][3]{1em} \\4
\convTeXLength[cm][2]{1em} \\5
\convTeXLength[dd][3]{1em} \\6
\convTeXLength[em][3]{1em} \\7
\convTeXLength[ex][3]{1em} \\8
\convTeXLength[in][3]{1em} \\9
\convTeXLength[km][3]{1em} \\10
\convTeXLength[m][3]{1em} \\11
\convTeXLength[mm][3]{1em} \\12
\convTeXLength[mu][3]{1em} \\13
\convTeXLength[pc][3]{1em} \\14
\convTeXLength[pt][3]{1em} \\15
\convTeXLength[px][3]{1em} \\16
\convTeXLength*[sp][3]{1em}

\convTeXLength[bp][-1]{\linewidth} \\3
\convTeXLength[cc][0]{\linewidth} \\4
\convTeXLength[cm][1]{\linewidth} \\5
\convTeXLength[dd][2]{\linewidth} \\6
\convTeXLength[em][3]{\linewidth} \\7
\convTeXLength[ex][4]{\linewidth} \\8
\convTeXLength[in][5]{\linewidth} \\9
\convTeXLength[km][6]{\linewidth} \\10
\convTeXLength[m][7]{\linewidth} \\11
\convTeXLength[mm][8]{\linewidth} \\12
\convTeXLength[mu][9]{\linewidth} \\13
\convTeXLength[pc][10]{\linewidth} \\14
\convTeXLength[pt][11]{\linewidth} \\15
\convTeXLength[px][12]{\linewidth} \\16
\convTeXLength*[sp][13]{\linewidth}

\convTeXLength[em][2]{1}\% default is cm
\convTeXLength[em][2]{2}\\3
\convTeXLength[em][2]{3}
The current example linewidth is 202.32779 pt, which is
18.48 em
43.07 ex
332.59 mu

Test
8.13 em
18.96 ex
146.38 mu

4.2 Converting a value with given unit into another one

1234.5 m
123450.0 cm
1.234506e+06 mm
3499402.985833 bp
1.2345 km

1 \convLength[m]{1.2345}{km}\\n2 \convLength[cm]{1.2345}{km}\\n3 \convLength[mm]{1.2345}{km}\\n4 \convLength[bp]{1.2345}{km}\\n5 \convLength[km]{4}{3499402.985833}{bp}