

The decimalcomma package

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1 Why this package?

In many countries, except notably in Anglo-Saxon countries, the comma is used as the decimal separator for numbers. However, in the math mode of \TeX , the comma is always, by default, treated as a punctuation symbol and therefore is followed by a space. This is appropriate in intervals: $\$[a, b]\$$ results in $[a, b]$, but is not appropriate for numbers where the comma represents the decimal separator. For example, $\$12,5\$$ is displayed as 12, 5 instead of 12,5.

Two very convenient packages allow handling the decimal comma. In math mode:

- With `icomma` (intelligent comma) by Walter Schmidt [1], the comma behaves as a punctuation character if it is followed by a space; otherwise, it is treated as an ordinary character.
- With `nccomma` by Alexander I. Rozhenko [2], the comma behaves as an ordinary character if it is followed by a digit (without a space); otherwise, it is considered a punctuation character.

It appears that this second approach is preferable because unlike with `icomma`, you are not required to add a space after the comma when it's not followed by a digit; however, `nccomma` poses several compatibility issues, especially when used with `babel` in conjunction with `numprint` [4] and its `auto1language` option (at least for certain languages such as French and Spanish). Another issue with `nccomma` is that compiling with `Lua \TeX` or `X \TeX` fails when using `unicode-math` and `\setmathfont`.

Let it be noted that a code proposed by Claudio Beccari [3], similar to that of `nccomma`, presents the same type of issues.

Therefore, we propose a new package, functionally identical to `nccomma` but with lighter code, and without the aforementioned incompatibilities.

2 Bugs and problems

When `unicode-math` is used, it must be loaded *before* `decimalcomma`¹.

¹This is also true for `icomma`.

Here, we are revisiting what Walter Schmidt wrote in the documentation of his `icomma` package:

In case `decimalcomma` is used together with the `dcolumn` package [5], a comma to be printed as the decimal separator in a column of type D is to be specified as `\mathord\mathcomma`, rather than `{,}`, since the latter leads to an error. For instance:

```
\begin{tabular}{... D{,}\mathord\mathcomma}{2} ...}
```

Note that specifying the comma as the related input character works as usual. Generally, since the `decimalcomma` package makes the comma ‘active’, further problems are not unlikely.

3 Implementation

This first piece of code aims to generate an appropriate error message, if you load `unicode-math` *after* `decimalcomma`. To achieve this, first we check if `unicode-math` has been loaded before. In that case, the boolean `DC@unicodemath` will be set to true. Then, at the end of the preamble, when all the packages have been loaded, we perform a new verification. If `unicode-math` has been loaded after but not before, the appropriate error message is displayed. Without this code, the compilation would produce an error message mentioning a problem on `\futurelet`, incomprehensible for the novice.

```
1
2 \newif\ifDC@unicodemath
3 \@ifpackageloaded{unicode-math}{\DC@unicodemathtrue}
4 \AtBeginDocument{\@ifpackageloaded{unicode-math}{
5   \ifDC@unicodemath\else
6     \PackageError{decimalcomma}{decimalcomma must be loaded
7       after unicode-math}{If you didn't load decimalcomma
8       yourself, check which package uses it.}
9   \fi
10  }{}}
11 }
12
```

We have taken up Walter Schmidt’s fundamental idea for looking up the next character, but with an execution loop to test all the digits from 0 to 9 instead of `\space`. We could have also used ten nested `\if ... \else ... \fi` structures and that works very well.

At `\begin{document}`, we store the original `\mathcode` of the comma, in the `\mathcomma` macro, and then we make the comma active in math mode.

```
13 \AtBeginDocument{%
14   \mathchardef\mathcomma\mathcode'\,%
15   \mathcode'\,="8000%
16 }
17
```

The active comma checks the next input character. If the next character is in the list 0123456789, the active comma returns `\mathord` with the saved `\mathcomma`, so that no space will be added after the comma. Otherwise, `\mathcomma` is returned without `\mathord`, thus the comma behaves by default as a `\mathpunct`.

```
18 {\catcode',=\active
19 \gdef,{\futurelet\@next\sm@rtcomma}}
20
21 \def\sm@rtcomma{%
22   \@tfor\@let@token:=0123456789%
23   \do{\expandafter\ifx\@let@token\@next\mathord\@break@tfor\fi}%
24   \mathcomma}
25
```

References

- [1] *The icomma package for L^AT_EX 2_ε*. Walter Schmidt, CTAN, v2.0 2002/03/10.
- [2] *The ncccomma package*. Alexander I. Rozhenko, CTAN, v1.0 2005/02/10.
- [3] *Intelligent commas*. Claudio Beccari, The PracT_EX Journal, 2011, No.1.
<https://tug.org/pracjourn/2011-1/beccari/Intcomma.pdf>
- [4] *The numprint package*. Harald Harders, CTAN, v1.39 2012/08/20.
- [5] *The dcolumn package*, David Carlisle. CTAN, v1.06 2023/07/08.