

The decimalcomma package

Antoine Missier
antoine.missier@ac-toulouse.fr

2023/12/28, v1.3

1 Why this package?

In many countries, except notably in the English-speaking countries, the comma is used as the decimal separator for numbers. However, in the math mode of \LaTeX , 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 `auto language` option (at least for certain languages such as French and Spanish). Another issue with `nccomma` is that compiling with \LaTeX or \XeTeX 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 code for looking up the next character, and define the comma as active in math mode, 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.

We chose to directly load `icomma` instead of transcribing the beginning portion of its code. This avoids potential conflicts with an extension that also uses `icomma`².

```
13 \RequirePackage{icomma}
14
```

²The loading of `icomma` ensures also proper functioning when using `babel-french` and `numprint` with its `autolanguage` option (an issue that does not arise with `babel-spanish`, for example).

First we introduce what `icomma` does. At `\begin{document}`, the original `\mathcode` of the comma is stored, in the `\mathcomma` macro, and then the comma is defined as active in math mode. The active comma checks the next input character.

```
\AtBeginDocument{%
  \mathchardef\mathcomma\mathcode'\,%
  \mathcode'\,="8000 %
}
{\catcode'\,=\active
 \gdef,{\futurelet\@let@token\sm@rtcomma}
}
```

Then `icomma` defines the `\sm@rtcomma` macro, but this macro is redefined here to match the expected behavior. 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`. Note that `\@decimal@digit` must be called before `\@let@token` after `\ifx`.

```
15 \def\sm@rtcomma{%
16   \@tfor\decimal@digit:=0123456789%
17   \do{\expandafter\ifx\decimal@digit\@let@token\mathord%
18     \@break@tfor\fi}%
19   \mathcomma}
20
```

Special thanks to J.F. Burnol for his insightful remarks and valuable advice and let us pay tribute to Walter Schmidt, who is regrettably deceased.

References

- [1] *The icomma package for L^AT_EX 2_ε*. Walter Schmidt, CTAN, v2.0 2002/03/10.
- [2] *The nccomma 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.