

Some misunderstood or unknown L^AT_EX 2_ε tricks (X)

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1 Introduction

This is the Xth edition of my TUGboat ‘Tips & Tricks.’ This time, we shall first see how to write ‘dancing text,’ roman numerals, how to draw under and over braces on same elements, and how to display aligned (in)equations systems. We will then end by discussing on BibL^AT_EX and Biber, which constitute a promising alternative to BibT_EX.

2 Dancing text

I am not aware of any L^AT_EX easter eggs, and a search on the Internet lead me to [6], where Mr. Le Floch proposes some code to write dancing text. I adapted his version to only make `\emph`-declared text as dancing. The dancing angle is set between -10° and 10° .

Consider the following working example.

```
\documentclass{article}
\usepackage{rotating}
\usepackage[first=-10,last=10]{lcg}
\makeatletter
\newcommand{\globalrand}{\rand\global%
\cr\end\cr\end}
\makeatother
\newcommand{\randompos}[1]{%
\expandafter\let\csname old\string#1%
\endcsname#1%
\expandafter\def\expandafter#1%
\expandafter##\expandafter1\expandafter{%
\csname old\string#1\endcsname{\protect%
\globalrand\protect\turnbox{%
\value{rand}}{##1}\protect%
\phantom{##1}}}%
}
\randompos\emph
\begin{document}

\section{Example}
\emph{Some} \emph{emphasized} \emph{text},
\emph{with} \emph{random} \emph{directions}

\end{document}
```

You can evidently declare e.g. `\randompos\section` if you want the sections’ titles to be dancing too. For example,

```
\dancing{Here} \dancing{is}
\dancing{an} \dancing{example!}
```

produces

Here is an example!

Note that there are evidently other techniques to produce dancing text.

3 Writing roman numerals

As shown at [11], defining

```
\makeatletter
\newcommand{\rmnum}[1]{\romannumeral #1}
\newcommand{\Rmnum}[1]{\expandafter%
\@slowromancap\romannumeral #1@}
\makeatother
```

in the preamble lets you use `\rmnum{num}` to typeset num as a lowercase roman numeral, and `\Rmnum{num}` to typeset it as an uppercase roman numeral.

4 Using over and under braces on same elements

It might be desirable to output constructs like

$$a + b + \overbrace{c + d + e + f + g}^x + \underbrace{h + i + k + l}_y = e^2.$$

Several solutions were proposed at [8]:

1. You can type the equation twice, once using `\phantom` commands and then raising it:

```
\[a+b+\overbrace{c+d+e+f+g}^{\scriptstyle x}+%
h+i+k+l=e^2\]
\vspace{-35pt}
\[\phantom{a+b+c+d+}\underbrace{\phantom{e+f+g+h+i}}_{\scriptstyle y}\phantom{+k=}%
+k=e^2\]
```

(A similar method is to use `align`, `\hphantom` and `\\[size]`.)

2. A short solution is to use `\ooalign` which is defined in L^AT_EX’s kernel, and is used in definition of some special text accents and math symbols:

```
\[
\ooalign{
$a+b+\overbrace{c+d+e+f+g}^{\scriptstyle x}+%
h+i+k+l=e^2$\cr
$\phantom{a+b+c+d+}\underbrace{\phantom{e+f+g+h+i}}_{\scriptstyle y}$\cr
}
\]
```

3. An equally good solution is to use `\rlap`:

```
\[
a+b+\rlap{$\overbrace{\phantom{c+d+e+f+g}}^{\scriptstyle x}$}c+d
+\underbrace{e+f+g+h+i}_{\scriptstyle y}+k+l=e^2
\]
```

4. A total reimplementation could also define a macro which takes three arguments: the first part only under the overbrace, the middle part between both and the last part only over the underbrace; place this then into a similar `\ialign` structure with three cells and three rows. The braces are then put into the plain \TeX equivalent of `\multicolumn{2}`. See [8] for more details on this.

5 Aligned systems of (in)equations

Systems of aligned (in)equations were generally typeset using tricky combinations of environments. I recently discovered the `systeme` package by Christian Tellechea. This package allows you to typeset e.g.

$$\begin{cases} 2a - 3b + 4c = 2 \\ a + 8b + 5c = 8 \\ -a + 2b + c = -5 \end{cases}$$

using

```
\systeme{2a-3b+4c=2,a+8b+5c=8,-a+2b+c=-5}
```

Consider having a look at [10] if you are interested.

6 Bib \LaTeX and Biber

An important part of this section comes from [7].

6.1 Bib \TeX problems

The well-known Bib \TeX program is called to sort and format entries of your `.bib` files according to a specified style. This style is chosen according to the `\bibliographystyle{mystyle}`

command, where `mystyle` is evidently the style you want to use (e.g. `IEEEtran.bst` to conform to the IEEE standards; [4]).

However, Bib \TeX suffers from many problems, which mainly come from the fact that this is an old program.

As an example, a recurrent problem is the fact that it chokes on non-ASCII database entries and forces you to write replacements like `\{"a}` instead of `ä`. This is the major complaint about Bib \TeX , because apart from it being inconvenient, there are two major issues with this convention:

1. One subtle problem is that the extra set of braces suppresses the kerning on both sides of all non-ASCII letters,
2. Simply ignoring all accents may not be the correct way to handle them. For example, in Danish, the letter ‘ä’ is the very last letter of the alphabet, so it should be alphabetized after ‘z’. Bib \TeX will sort it like an ‘a’. [3]

Bib \TeX sorting is also not case-insensitive (because its sorting algorithm uses ASCII codepage order). [3] This is generally of concern too.

6.2 Solutions

Many solutions were proposed to make a ‘better’ Bib \TeX . There is `bibtex8`, which includes support for 8-bit encodings (provided that you supply it with a suitable `.csf` file and give the `--csfile` switch on the command line [3]), but still does not support Unicode [7]. It can sort case-sensitively. [3] There is also `bibtexu`, which should support UTF-8 bibliographies, but which is not well-known [7] and seems no longer maintained.

The state-of-the-art \LaTeX bibliography solution is said to be the `biblatex` package in conjunction with the `biber` program.

6.3 Differences between Bib \TeX and Bib \LaTeX

There are many advantages to use this solution. For example,

1. Encoding issues are gone thanks to Biber, so that you can output simple UTF-8 text without any escape sequences other than those mandated by the \LaTeX syntax (e.g. `\&`, `\#`, ...), [7]
2. Biber also lets you write more entries than with Bib \TeX because it ‘has no resource limits at all,’ [12]
3. Bib \LaTeX supports many fields that are not supported by many traditional styles (e.g., `doi`, `eprint` [7], `subtitle`, `titleaddon`, `maintitle` for multi-volume works, `editortype` [5], ...),
4. With Biber, you do not have to enclose title in another pair of braces too since it leaves the casing untouched (case insensitiveness), [7]
5. Bib \LaTeX can make the process of writing ‘ibid,’ ‘op.cit.’ etc., when necessary, [2, 3]
6. Biber is in fact not limited to the `.bib` format, and it now has a modular driver architecture and will be extended to enable it to read other data sources. The latest Biber has beta support for RIS, for example. You can also mix and match as many data sources of any supported type too.

Bib \LaTeX already supports the IEEE style. For example, you might choose this style using [1, 9]

```
\usepackage[style=ieee]{biblatex}
```

6.4 Migrating from Bib \TeX to Bib \LaTeX

Fortunately, migrating from Bib \TeX to Bib \LaTeX is not a complex task. We shall consider the \LaTeX syntax point of view, and then the Bib syntax one.

6.4.1 L^AT_EX syntax

Migrating from BibT_EX to BibL^AT_EX should cause you no special troubles. Here are some transitional facts coming from [5]:

- With BibT_EX, the *bibliography style* was chosen using

```
\bibliographystyle{(somestyle)}
```

With BibL^AT_EX, as we said earlier, one can directly specify it at package's loading, together with other options:

```
\usepackage[style=(somebiblatexstyle),%
(other options)]{biblatex}
```

If you were using the natbib package, pass the natbib=true option to biblatex. The natbib option will automatically create the relevant aliases for the \citep and \citete commands, so you can use them as before. If your file has previously been compiled using natbib, you may need to delete some of the auxiliary files created by latex and bibtex for it to work properly,

- With BibT_EX, *printing the bibliography* where you want is achieved thanks to

```
\bibliography{mybibfile}
```

where mybibfile is the name of your .bib file.

With BibL^AT_EX, use

```
\printbibliography
```

where you want your bibliography to be printed.

To specify your bib file, the command

```
\bibliography{mybibfile}
```

is generally used, so that both commands have separate roles.

6.4.2 Bib syntax

Changes to your BiB_TE_X .bib files are not mandatory, but you will miss some of the goodies offered by BibL^AT_EX if you decide not to modify them. It is advised at least to change [5]

- the address fields to location to be able to use the maxitems option,
- the journal fields to journaltitle,
- year, month and day to an ISO formatted date, e.g. date={2010} or urldate={2010-08-11}, to let BibL^AT_EX make use of some options like date=short, etc.

You might find the complete biblatex documentation at [3].

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