Horrors in \LaTeX: How to misuse \LaTeX\ and make a \textit{copy editor} unhappy*

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1 Introduction

In the past I have been in charge of producing several volumes of proceedings of mathematical conferences. For each of them the task was to reshape the papers sent by authors in \LaTeX\ format.

One paper was written with a well-known word processor; with a printed copy and the file saved as “text only”, the article was put into \LaTeX\ in less time than others which claimed to be already \LaTeX. And were not. Not completely, at least.

Thus I had the idea to collect some of the most significant examples, in order to warn users from the most common mistakes and horrors. A version of this collection of horrors is available on the net.

In this paper, derived from a talk at the GI Meet\-\-\-\-\-ing 2004, I would like to present some examples in slightly different form. Some of them are new.

All examples are faithfully reproduced, in many cases also the original line breaks in the input are maintained; some have been modified to remain in the margins for this journal. I have only masked names and affiliations. With [... I indicate the omission of some lines in the manuscript.

2 Recent news?

A paper received in 2003 started as follows:

\begin{verbatim}
\documentstyle[12pt,twoside,xy]{article}
\input{amssymb.sty}
%\oddsidemargin -1.5mm
%\evensidemargin -1.5mm
\textwidth 5.5in
\textheight 7.1in
\newtheorem{de}{Definition}
\newtheorem{th}{Theorem}
\newtheorem{pr}{Proposition}
\begin{document}
$^\ast$-IDENTITIES IN MATRIX SUPERALGEBRAS
\vspace{0.2in}
\footnote{Partially supported by Grant MM1106/2001 of the Xxxxxxxxx Foundation for Scientific Research.}
\centerline{Centre of Mathematics and Informatics}
\centerline{University of Xxxxxx “X.Xxxxxxx”}
\centerline{7017 Xxxxxx, Xxxxxxxx}
\centerline{email: xxxxxxx@xxx.xx.xxxx.xx}
\begin{abstract}
\[\ldots\] I indicate the omission of some lines in the manuscript.
\end{abstract}
\begin{section}{I. Basic notions}
\end{section}
\end{document}
\end{verbatim}

In order to modify the type block of a document, some high level packages are available; for example geometry. Avoid also “hand made” environments and sectional commands.

And, please, don’t use \textbackslash to terminate paragraphs; vertical space commands such as \vspace or \medskip should always go \textit{between} paragraphs. And don’t put \vspace commands in documents you are sending for subsequent copy editing.

3 One author writes, the other one reads

\begin{verbatim}
\documentclass[10pt,bezier]{article}
\usepackage{amsmath}
\usepackage{xy}
\begin{document}
\section*{2. Preliminaries on coalgebras, comodules}
\end{document}
\end{verbatim}

The command \texttt{\documentclass} has been maintained only for compatibility with old files. Moreover, the vast majority of those documents can be easily modified to exploit the new functions.

Sadly, in 2004 I received the following file.

\begin{verbatim}
\documentclass[12pt,twoside,xy]{article}
\usepackage{amssymb}
\usepackage{xy}
\begin{document}
\section{I. Basic notions}
\end{document}
\end{verbatim}

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* A version of this paper was presented at the GI Meet\-\-\-\-\-ing, Pisa (Italy), October 9, 2004.

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1 In Italian, at http://profs.sci.univr.it/~gregorio/orrori.pdf
Is the command \section an unknown beast? If one wants to escape the automatic numbering (though I don’t know why one should), it is easy enough to write \section* or \setcounter{secnumdepth}{-2} which is even better.

\LaTeX{}\ has several sectional commands which take care automatically of spacing and numbering details. If you want to modify these details, please use packages such as sectsty or titlesec. The copy editor will see the definitions in the preamble and take the proper actions.

5 Better with \LaTeX{} or Wordstar\textsuperscript{TM}?

\begin{verbatim}
Original input
Let $R$ be a finite $p$-ring whose additive group is
$R^{+} = \langle x_{1} \rangle \oplus \langle x_{2} \rangle \oplus \cdots \oplus \langle x_{n} \rangle $, where
$\langle x_{i} \rangle \cong C(p^{e_{i}})$ (1 \leq i \leq n), and
$1 \leq e_{1} \leq e_{2} \leq \cdots \leq e_{n}$ is a nondecreasing sequence of positive integers.
We can write
(1) $\displaystyle{ x_{i}x_{k} = \sum_{j=1}^{n} \alpha_{ijk}x_{j} \ (1 \leq i, k \leq n)}$, where $\alpha_{ijk}$ are integers such that
\[ \vdots \]
and
(5) $\displaystyle{ \sum_{k=1}^{n} \alpha_{rki}\alpha_{kjs} \equiv \sum_{k=1}^{n} \alpha_{iks}\alpha_{rjk} \ \text{mod} \ p^{e_{j}}} \ (1 \leq i, j, r, s \leq n)$.

Conversely, let $p$ be a prime, and let $G = \langle x_{1} \rangle \oplus \langle x_{2} \rangle \oplus \cdots \oplus \langle x_{n} \rangle$ be an additive group, where
\[ \vdots \]

Yes, this is part of a paper I received. Really. It vaguely resembles \LaTeX{}, but actually it is not. This author is trying to imitate the use of a (probably expensive) word processor. The only sure thing is that the result is equally awful. I have omitted points (2), (3), and (4) which are similar to (1) and (5).

6 How not to write

\begin{verbatim}
Original input
{\bf Proof:} Let $g \in G_H = B + \sum\limits_{\beta<\lambda^*} \sum\limits_{n<\omega} R_{\beta}y_{\beta}^{(n)}$. Then there exist a finite subset $N'$ of $\lambda^*$, $b \in B, k \in \omega$, such that\%
\centerline{$g = b + \sum\limits_{\beta \in N'} \sum\limits_{n \leq k} a_{\beta,n}y_{\beta}^{(n)}$.}\%
Since $y_{\beta}^{(n)} - \frac{p^k}{p^n}y_{\beta}^{(k)} \in B' \subseteq B$ this expression reduces to\%\
\centerline{$g = b' + \sum\limits_{\beta \in N'} a_{\beta}y_{\beta}^{(k)}$} for some $a_{\beta} \in R_{\beta}$.
\end{verbatim}

It was not only an example of terrible mathematical writing. Search for clarity, above all. Some more words for the mathematically inclined: avoid overlong descriptions of sets, where the reader has to try hard in order to find the exit. Better say: “let $X$ be the set...”.

Parentheses in a math paper should always be upright. Most publisher have special fonts for this, so it is not necessary to write \textup{}() all the time. A good copy editor is usually able to spot and correct them, in any case.

7 Help!

\begin{verbatim}
{\bf Proof:} Let $g \in G_H = B + \sum\limits_{\beta<\lambda^*} \sum\limits_{n<\omega} R_{\beta}y_{\beta}^{(n)}$. Then there exist a finite subset $N'$ of $\lambda^*$, $b \in B, k \in \omega$, such that\%
\centerline{$g = b + \sum\limits_{\beta \in N'} \sum\limits_{n \leq k} a_{\beta,n}y_{\beta}^{(k)}$.}\%
Since $y_{\beta}^{(n)} - \frac{p^k}{p^n}y_{\beta}^{(k)} \in B' \subseteq B$ this expression reduces to\%
\centerline{$g = b' + \sum\limits_{\beta \in N'} a_{\beta}y_{\beta}^{(k)}$} for some $a_{\beta} \in R_{\beta}$.
\end{verbatim}
Putting $N=\{\beta \in N' \mid a_\beta \neq 0\}$ \hspace{2cm} ($N \neq \emptyset$ for $g \notin B$) the conclusion of the lemma follows since $\lfloor y_\beta \rfloor_{\l} \cap \lfloor y_\beta' \rfloor_{\l}$ is finite for $\beta \neq \beta'$ by Corollary 1.11. $\hfill{\square}$

I wanted to reproduce a pretty large extract of this paper just to show how it is possible to write unthinkable things.

It seems the author is sufficiently acquainted with \LaTeX{} to know the difference between \notin{} and \not\in{} (which must not be used); however the same author ignores the existence of the \texttt{displaymath} environment and emulates it with a complicated construction with \texttt{centerline} (an unsupported command).

Another horror is worth noting: this author has the habit to use “shorthands” for the greek letters ($\beta$ stands for \texttt{\beta} and so on; see later on). This has the consequence of obfuscating the code, making it difficult to spot things on the manuscript, especially when a “b” and a “\beta” are near to each other.

For the mathematically inclined: please note

\begin{verbatim}
$\beta \in B, k \in \mathbb{N}, a_{\beta,n} \in \mathbb{R}_{\beta}$ \hspace{2cm} ($\beta \in N', n \leq k$)
\end{verbatim}

where five separated formulas are joined into one! Keep every formula segregated in the proper way.

I find particularly exhilarating the following:

\begin{verbatim}
Putting $N=\{\beta \in N' \mid a_\beta \neq 0\}$ \hspace{2cm} ($N \neq \emptyset$ for $g \notin B$) the...
\end{verbatim}

which, of course, should have been written

\begin{verbatim}
Putting $N=\{\beta \in N' \mid a_\beta \neq 0\}$ \hspace{2cm} ($N \neq \emptyset$ for $g \notin B$), the\
\end{verbatim}

The relation symbol \mid{} is unknown to most authors, it seems.

8 I’m drowning!

\begin{verbatim}
\item Let $S$ be the Diophantine monoid\$S = \{ x \in \mathbb{N}^3 \mid 2x_1 + 5x_2 = 3x_3\}$.\$
\end{verbatim}

As already seen, $S$ is generated by $g_1 = (3, 0, 2), g_2 = (0, 3, 5), g_3 = (1, 2, 4), g_4 = (2, 1, 3)$.

One verifies easily that representation by $g_1$ and $g_2$ is unique and the Cale representations of $g_3$ and $g_4$ by base $Q = \{g_1, g_2\}$ are $2g_3 = g_1 + g_2, 2g_4 = g_1 + g_2, 2g_3 = g_1 + g_2,$ $2g_4 = g_1 + g_2$. It follows that $S_k = \{1, 1, 1\}$ and $S_n = \{1, 1, 1\}$.

The author is in total havoc: arbitrary spacing, unseparated formulas, chaotically forced new lines. All in a single \texttt{item} in a list. When you send a paper for subsequent typesetting, don’t worry about “Overfull box” messages; it is the task of the copy editor to reshape the paper for the final format. Concentrate on the writing, not on the form. But try to write correct code, first of all.

9 Is it \LaTeX{}?

\begin{verbatim}
% This is a \LaTeX{} file \documentclass{article}
\usepackage{amsmath}
\newtheorem{thm}{Theorem}[section]
\newtheorem{cor}[thm]{Corollary}
\newtheorem{lem}[thm]{Lemma}
\newtheorem{prop}[thm]{Proposition}
\newtheorem{ex}[thm]{Example}
% \newtheorem{rem}[thm]{Remark}
\maketitle
\begin{document}
\section{Introduction}
\end{document}
\end{verbatim}

A simple \texttt{center} environment could have saved the trouble with the dedication: why set 6 cm of space without knowing the line width? And why mix imperial and metric systems? Recall that AMS classes have a \texttt{dedicatory} command to be given before \texttt{maketitle}.

It is difficult to find so many horrors in such a little space, you will be thinking. Well, no: someone is able to do better, we’ll see. However, here is the beginning of the paper.

The author is in total havoc: arbitrary spacing, unseparated formulas, chaotically forced new lines. All in a single \texttt{item} in a list.
property for ideals in Krull domains to generalized Krull domains, in the same spirit of a work on generalized Dedekind domains by Gabelli and Popescu [8]. A par

\[ A \text{ generalized Krull domain (GK-domain for short) is a PVMD such that } \not\in (P^2)_t, \text{ for each } t\text{-prime ideal } P \text{, and each nonzero principal ideal has only finitely many minimal } (t\text{-})\text{-primes (cf. } [5, \text{ Theorem 3.9}]. \text{ GK-domains of } t\text{-dimension one coincide with the class of Krull domains. For more details see [5].}\]

Apparently the author doesn’t like that the first paragraph after a section title is not indented. So a wonderful idea came to his mind.

Original input

\def\ind{}\parindent0pt

This is the wonderful idea! Writing \par everywhere and beginning all paragraphs with \ind. Where does the \hskip 0.125in\relax come from, I don’t know. Let’s see how one could have achieved a ‘slightly better’ result:

Correct input

\usepackage{indentfirst}

Notice also the error in cf. [5, Theorem 3.9] which should be written with the automatic commands and the non-breaking space:

Correct input

\cite[Theorem 3.9]{a-label}

But these are subtleties.

10 A touch of class

Original input

\title{Modules induced from a normal subgroup of prime index}
\begin{center}
\large\textsf{Modules induced from a normal subgroup of prime index}
\end{center}
\author{X.X. Xxxxxx}

Trying to modify the typesetting of their documents is common among authors. This piece of evidence is hilarious.

11 Definition frenzy

Original input

\def\Ass{\text{Ass}}
\def\alpha{\alpha}
\def\lambda{\lambda}

These are only a few definitions set by an author. We all know, of course, that they are all wrong. Some times ago, an author who used to redefine \c wrote to me asking to solve a problem: the name of an author in the bibliography required a cedilla and, strangely, it appeared that there was no way to make \LaTeX do this.

“Wait! Writing \texttt{\alpha} is too long!” objects the author. The answers to this objection can be: (1) use a smart editor; (2) the \LaTeX source file is more readable. Emacs is not the only smart editor, there are many on every platform and some of them are free. For GNU/Linux there is Kile.

Regarding the definitions, consult a manual in order to find the better way to set them; for a “log” type operator, use the \texttt{amsmath} package and the command \texttt{\DeclareMathOperator}:

Correct input

\DeclareMathOperator{Ass}{Ass}

I should say that this operator is common in Commutative Algebra: it denotes the set of ‘associated ideals’. It is not correct to define an operator like that as \texttt{\texttt{\log x}}, because the spacing is excessive and in some cases wrong; compare \texttt{\log x} and \texttt{\log(xy)}.

A paper I worked on recently had 250 lines of various definitions. Only 38 remained. When you send a work to others, ensure to erase from the preamble all unused commands. Most of all, ensure that all loaded packages are included in the standard distributions, otherwise send them along with the paper.

12 Theorems

Original input

\newtheorem{satz}{Theorem}[section]
\newtheorem{prop}{Proposition}[satz]
\newtheorem{cor}{Corollary}[satz]
\newtheorem{rem}{Remark}[satz]
\newtheorem{ex}{Example}[satz]
\newtheorem{exas}{Examples}[satz]

There should be some obscure reasons why a \texttt{\smallskip} is needed after a corollary, but not after a theorem. And to impose a completely useless \texttt{\smallskip} before a statement. There were similar definitions of pseudo-environments for the other kinds of statements.

A common typographical practice is to set statements of theorems in italics, in order to distinguish
them visually from the normal text: they are important and ought to be found easily. It is acceptable, of course, that someone prefers to set them in upright roman type. This author, at least, groups every definition in the preamble, so that the copy editor can easily change the format.

However, the point of this example is not only the format of the statements. What is the difference in typing between

\begin{mylabel}
$2+2=4$
\end{mylabel}

and

\begin{SATZ}{mylabel}
$2+2=4$
\end{SATZ}

excluding from consideration the number of characters? I see many advantages to the second form. For instance, you can search your document for labels using a well defined key (i.e., \label). I am not a fan of completely structured documents à la XML, though they have their importance; but a typed paper is not the same as an XML document. With properly used environments, you add structure to the document and so it becomes easier to thumb through it.

A smart text editor is able to produce a skeleton of any environment you need with only a few keystrokes.

“What about the upright type?” you ask. Well, using amsthm or ntheorem it is very easy.

```latex
\usepackage{amsthm}
\theoremstyle{definition}
\newtheorem{SATZ}{Theorem}
\newtheorem{ex*}{Example}
\newenvironment{ex}{\begin{ex*}}{\qed\end{ex*}}
```

There is also a solution, a bit more complex, if you want to be able to say also \qedhere in an environment.

```latex
\begin{makeatletter}
\newenvironment{dsp}{\refstepcounter{equation}\begin{trivlist}
\item[\quesa] (\theequation)}\end{trivlist}}
\end{makeatletter}
```

It is not advisable to tamper with \hangindent and \hangafter if you don’t know what you are doing. The spacing chosen by the author was arbitrary, to say the least.

13 This author knows what to do!

14 Groups
The purpose of putting all these things inside \mbox{is an unconceivable mystery. Note the astounding weirdness of using a relation symbol such as $\parallel$ instead of the correct delimiter $\|$}. If the definition is without $\left$ and $\right$, it would be better to use the pair $\lVert$ — $\rVert$ available with \textit{amsmath.}

More: all variation must be defined in abstract terms, so that it is sufficient to change only one of them, if needed.

\begin{verbatim}
\newcommand{\supp}[1]{\left\{#1\right\}}
\newcommand{\suppl}[1]{\supp{#1}_\lambda}
\newcommand{\suppa}[1]{\supp{#1}_A}
\newcommand{\norm}[1]{\left\|#1\right\|}
\newcommand{\norma}[1]{\norm{#1}_A}
\end{verbatim}

\section*{Uniformity}

\begin{verbatim}
{\bar{g}} = g + U; \in G
$\supp{g} = \{(a,i) \in \times \rho, \mid g_{a,i} \neq 0\}$
$G^a = \{g \in G, \norm{g} < a\} (a < \lambda)$
\end{verbatim}

These three excerpts didn’t show in the same page, but they were in one and the same paper. Three different notations are used to denote one and the same thing.

Don’t do this yourself, try to be consistent. It can be convenient to define a suitable command, for example

\begin{verbatim}
\newcommand{\set}[2]{\{#1, \mid #2 \}}
\end{verbatim}

\section*{Two consecutive paragraphs}

Recall \textit{[ComRo, page 5]} that a Tychonoff space is called \textit{$\omega$-compact} when each of its countable subset lies in a compact subspace.

Recall $\{g \in (U_1, p. 39)\}$ that a topological ring $R$ is said to be \textit{left countably linearly compact} if:

\begin{verbatim}
I’m not blaming the use of the English language, of course. You can spot strange ways of inserting similar objects, in this case bibliographical citations. The use of $\cite$ allows for avoiding the problem that I think was at the origin of the mysterious $\textbf{rm}\ldots$: the fact that in statements of theorems, the citation (when done by hand) comes up in italics. Verify, as an exercise, that $\cite$ yields the citation in roman.
\end{verbatim}

\begin{verbatim}
Recall that a Tychonoff space is called \textit{left countably linearly compact} $\cite[p. 39]{ComRo}$ when each of its countable subsets lies in a compact subspace.

Recall that a topological ring $R$ is said to be $\textbf{left countably linearly compact} \cite[p. 39]{ComRo}$ if ...
\end{verbatim}

Don’t forget the non-breakable space; use $\textbf{left countably linearly compact}$ instead of explicit font change commands.

\section*{Bibliographies}

\begin{verbatim}
\begin{thebibliography}{CR90}
\end{thebibliography}
\end{verbatim}

The \textit{thebibliography} environment does what the author painfully wants to achieve by hand and much more better, because it sets up a list taking into account the width of the label given as an argument.

Note the pathetic \textit{[[CR90]]} and the arbitrary spacing between initials and surnames. I prefer to space normally the initials, others recommend a thin space. Act consistently.

\begin{verbatim}
\begin{thebibliography}{CR90}
\end{thebibliography}
\end{verbatim}

Another bibliography.

\begin{verbatim}
\end{verbatim}

Line 1: Fortunately, it is rare to see similar things. Write C. Y. Hong, if you prefer, but definitely put a space between initials and surname.

Line 3: In the frenzy of font changing the spaces are lost. Perhaps, using $\textbf{bf}$ instead of the obsolete $\bf$, it wouldn’t have happened.

Line 4: We can’t understand what the command \textsl is there for; the name of the cited author is "J\o ngrundrup"; probably the author said to himself: “The slash is a kind of accent, it should be done with a slash, shouldn’t it?” No.

Line 6: Inconsistent spacing; the name of the journal is wrong; the number intervals must be denoted with the en dash.

\begin{verbatim}
\end{verbatim}
18 Inventing hot water

A variation on the theme of proofs. Don’t reinvent the wheel — use \texttt{amsthm} which also provides the command \texttt{edhere} to solve the puzzling situations when a proof ends with a displayed equation.\footnote{This is an occasion to remember Michael J. Downes, esteemed developer of AMS-L\TeX; we all miss him.}

The proposed definition is \textit{completely wrong}:
1. it doesn’t set vertical space before and after the environment;
2. it uses obsolete commands;
3. puts a black mark after the last full stop in the proof, with an awful effect.

19 Inventing lukewarm water

A distance $d$ for $G$ is said to be faithful, if the following \texttt{(*)} is satisfied.

\begin{equation}
\text{If } d(\alpha, \alpha') = 0, \text{ then } G_\alpha \text{ and } G_{\alpha'} \text{ are isomorphic.}
\end{equation}

As a matter of form, at least one faithful distance always exists.

What to say about this gem? The author is puzzled with a condition to which he doesn’t want to give a name, but a symbol. Use \texttt{amsmath}.

Such a label can be referred to in abstract way with \texttt{thetag{(*)}}; the document class will provide the correct parentheses around the symbol. You can also assign a \texttt{label} to the equation and use \texttt{ref} or \texttt{eqref}.

20 Inventing cold water

The author defines by hand the list making commands. Enough said.

21 The search for perfection

The two examples are drawn from different documents. Their authors wanted to increase the spacing between the title and the text of the section. Clearly they did it in a terrible way; the second example is ridiculous. What a surprise when compiling also the table of contents!

These decisions are best left to the document class, in particular if you are sending the paper for subsequent copy editing. If you feel that the spacing is not satisfying for your personal taste and for personal documents, then use packages such as \texttt{sectsty} or \texttt{titlesec}.

22 Nirvana

\textit{Lo giuro sul mio onore}. This is a quotation from Mozart’s “Don Giovanni”, libretto by Lorenzo Da Ponte, Act I, Scene 4. But it is that scoundrel Don Giovanni who says that, the reader will object. Yes, but trust me that the example is real, I still keep it religiously.

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